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GB Standard Smart PLC

User Manual 250515

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1.Product Selection

Host model	series	Digital quantity	Analog	485 mouths	Network port	Extension modules	signal board	SD card	Order Number
CR20	Compact	12 input 8 relay output	-	1 way	1 way	Not supported	support	support	6ES7 288-1CR20-0AA1
CR20XP		12 input 8 relay output	2 in 1 out	1 way	1 way	Not supported	support	support	6ES7 288-1CR20XP-0AA1
CR30		18 input 12 relay output	-	1 way	1 way	Not supported	support	support	6ES7 288-1CR30-0AA1
CR30XP		18 input 12 relay output	4 in 2 out	1 way	1 way	Not supported	support	support	6ES7 288-1CR30XP-0AA1
CR40		24 input 16 relay output	-	1 way	1 way	Not supported	support	support	6ES7 288-1CR40-0AA1
CR60		36 input 24 relay output	-	1 way	1 way	Not supported	support	support	6ES7 288-1CR60-0AA1
SR20	Standard	12 input 8 relay output	-	1 way	1 way	support	support	support	6ES7 288-1SR20-0AA1
ST20		12 input 8 transistor output	-	1 way	1 way	support	support	support	6ES7 288-1ST20-0AA1
SR20XP		12 input 8 relay output	2 in 1 out	1 way	1 way	support	support	support	6ES7 288-1SR20XP-0AA1
ST20XP		12 input 8 transistor output	2 in 1 out	1 way	1 way	support	support	support	6ES7 288-1ST20XP-0AA1
SR20PRO		12 input 8 relay output	4 in 2 out	1 way	1 way	support	support	support	6ES7 288-1SR20PRO-0AA1
ST20PRO		12 input 8 transistor output	4 in 2 out	1 way	1 way	support	support	support	6ES7 288-1ST20PRO-0AA1

SR30	Standard	18 input 12 relay output	-	1 way	1 way	support	support	support	6ES7 288-1SR30-0AA1
ST30		18 input 12 transistor output	-	1 way	1 way	support	support	support	6ES7 288-1SR30-0AA1
SR30XP		18 input 12 relay output	4 in 2 out	1 way	1 way	support	support	support	6ES7 288-1SR30XP-0AA1
ST30XP		18 input 12 transistor output	4 in 2 out	1 way	1 way	support	support	support	6ES7 288-1ST30XP-0AA1
SR40		24 input 16 relay output	-	1 way	1 way	support	support	support	6ES7 288-1SR40-0AA1
ST40		24 input 16 transistor output	-	1 way	1 way	support	support	support	6ES7 288-1ST40-0AA1
SR40XP		24 input 16 relay output	6 in 2 out	1 way	1 way	support	support	support	6ES7 288-1SR40XP-0AA1
ST40XP		24 input 16 transistor output	6 in 2 out	1 way	1 way	support	support	support	6ES7 288-1ST40XP-0AA1
SR60		36 input 24 relay output	-	1 way	1 way	support	support	support	6ES7 288-1SR60-0AA1
ST60		36 input 24 transistor output	-	1 way	1 way	support	support	support	6ES7 288-1ST60-0AA1

Digital Module	describe	Configuration selection	Power consumption	Order Number
EM DE08	8 digital inputs	EM DE08(8DI)	1.5W	6ES7288-2DE08-0AA0
EM DE16	16 digital inputs	EM DE16(16DI)	2.3W	6ES7288-2DE16-0AA0
EM DE32	32 digital inputs	EM DP01(DP)	3W	6ES7288-2DE32-0AA0
EM DR08	8 Relay outputs	EM DR08(8DQ Relay)	4.5W	6ES7288-2DR08-0AA0
EM QR16	16 Relay outputs	EM QR16(16DQ Relay)	4.5W	6ES7288-2QR16-0AA0
EM QR32	32 Relay outputs	EM DP01(DP)	5W	6ES7288-2QR32-0AA0
EM DT08	8 transistor outputs	EM DT08(8DQ Transistor)	1.5W	6ES7288-2DT08-0AA0
EM QT16	16 transistor outputs	EM QT16(16DQ Transistor)	2.5W	6ES7288-2QT16-0AA0
EM QT32	32 transistor outputs	EM DP01(DP)	2W	6ES7288-2QT32-0AA0
EM DR16	8 digital inputs 8 relay outputs	EM DR16(8DI/8DQ Relay)	5.5W	6ES7288-2DR16-0AA0
EM DR32	16 digital inputs 16 relay outputs	EM DR32(16DI/16DQ Relay)	10W	6ES7288-2DR32-0AA0
EM DT16	8 digital inputs 8 transistor outputs	EM DT16(8DI/8DQ Transistor)	3.5W	6ES7288-2DT16-0AA0
EM DT32	16 digital inputs 16 transistor outputs	EM DT32(16DI/16DQ Transistor)	6.5W	6ES7288-2DT32-0AA0
Analog Modules	describe	Configuration selection	Power consumption	Order Number
EM AE04	4 inputs (supports voltage or current)	EM AE04(4AI)	1.5W	6ES7288-3AE04-0AA0
EM AE08	8 inputs (supports voltage or current)	EM AE08(8AI)	2W	6ES7288-3AE08-0AA0
EM AE16	16 inputs (support voltage or current)	EM DP01(DP)	2.5W	6ES7288-3AE16-0AA0
EM AE32	32 inputs (support voltage or current)	EM DP01(DP)	3W	6ES7288-3AE32-0AA0
EM AQ02	2 outputs (supports voltage or current)	EM AQ02(2AQ)	1.5W	6ES7288-3AQ02-0AA0
EM AQ04	4 outputs (supports voltage or current)	EM AQ04(4AQ)	2.1W	6ES7288-3AQ04-0AA0
EM AQ08	8 outputs (supports voltage or current)	EM DP01(DP)	3W	6ES7288-3AQ08-0AA0
EM AM03	2 inputs 1 output (supports voltage or current)	EM AM03(2AI/1AQ)	1.1W	6ES7288-3AM03-0AA0
EM AM06	4 inputs 2 outputs (supports voltage or current)	EM AM06(4AI/2AQ)	2W	6ES7288-3AM06-0AA0
EM AM12	8 inputs 4 outputs (supports voltage or current)	EM DP01(DP)	3W	6ES7288-3AM12-0AA0
EM AM16	8 inputs and 8 outputs (supports voltage or current)	EM DP01(DP)	3.5W	6ES7288-3AM16-0AA0
Temperature Module	describe	Configuration selection	Power consumption	Order Number
EM AR02	Temperature collection 2 PT100	EM AR02(2AI RTD)	1.5W	6ES7288-3AR02-0AA0
EM AR04	Temperature collection 4 PT100	EM AR04(4AI RTD)	1.5W	6ES7288-3AR04-0AA0
EM AR08	Temperature collection 8 PT100	EM AE08(8AI)	2W	6ES7288-3AR08-0AA0
EM AT04	Temperature acquisition 4-way K-type thermocouple	EM AT04(4AI TC)	1.5W	6ES7288-3AT04-0AA0

EM AT08	Temperature acquisition 8-way K-type thermocouple	EM AE08(8AI)	2W	6ES7288-3AT08-0AA0
EM AN16	Temperature acquisition 16-channel NTC	EM DP01(DP)	3W	6ES7288-3AN16-0AA0
EM EN88	Analog 8 inputs, temperature acquisition 8 NTC	EM DP01(DP)	3W	6ES7288-3EN88-0AA0
EM EN4C①	Analog 4 input, temperature acquisition 12 channels NTC	EM DP01(DP)	3W	6ES7288-3EN4C-0AA0

Note①EM EN4Cname in EM Representation Module, E Indicates analog input , N express NTCenter, 4 Representation model The pseudo input is 4 channels, C express 16 Base Number 16#Ç correspond 10 Base12 express 12 indivual NTCaisle.

Note: The above table needs to be configured as EM DP01 Extension modules, hereinafter referred to as **Gongbei big points module** ,the remaining It is called a standard extension module.

Communication signal board	describe	configuration	Power consumption	Order Number
SB CM01	1 485 or 1 232 communication port	SB CM01	1W	6ES7288-5CM01-0AA0
SB CM02	Only 1 485 communication port	SB CM01	1W	6ES7288-5CM02-0AA0
Digital signal board	**describe**	**configuration**	**Power consumption**	**Order Number**
SB DE02	2 digital inputs	SB DT04	0.5W	6ES7288-5DE02-0AA0
SB DE04	4 digital inputs	SB CM01	0.8W	6ES7288-5DE04-0AA0
SB DE06	6 digital inputs	SB CM01	1W	6ES7288-5DE06-0AA0
SB QT02	2 transistor outputs	SB DT04	0.5W	6ES7288-5QT02-0AA0
SB QT04	4 transistor outputs	SB CM01	0.8W	6ES7288-5QT04-0AA0
SB QT06	6 transistor outputs	SB CM01	1W	6ES7288-5QT06-0AA0
SB DT04	2 digital inputs 2 transistor outputs	SB DT04	1W	6ES7288-5DT04-0AA0
Analog signal board	**describe**	**configuration**	**Power consumption**	**Order Number**
SB AE01-1AI	Analog 1 input (supports voltage or current)	SB CM01	1.5W	6ES7288-5AE01-0AA0
SB AE02-2AI	Analog 2 input (support voltage or current)	SB CM01	1.5W	6ES7288-5AE02-0AA0
SB AE04-4AI	Analog 4 input (support voltage or current)	SB CM01	2W	6ES7288-5AE04-0AA0
SB AE06-6AI	Analog 6 input (support voltage or current)	SB CM01	2W	6ES7288-5AE06-0AA0
SB AQ01-1AQ	Analog 1 output (supports voltage or current)	SB CM01	2W	6ES7288-5AQ01-0AA0
SB AQ02-2AQ	Analog 2 output (support voltage or current)	SB CM01	2W	6ES7288-5AQ02-0AA0
SB AQ04-4AQ	Analog 4 output (support voltage or current)	SB CM01	3W	6ES7288-5AQ04-0AA0
SB AM03-2AI1AQ	Analog 2 Input (voltage or current) 1 Output (voltage and current)	SB CM01	1W	6ES7288-5AM03-0AA0
SB AM04-2AI2AQ	Analog 2 input (voltage or current) 2 output (voltage and current)	SB CM01	1.5W	6ES7288-5AM04-0AA0
SB AM05-4AI1AQ	Analog 4 Input (voltage or current) 1 Output (voltage or current)	SB CM01	1.5W	6ES7288-5AM05-0AA0
SB AM06-4AI2AQ	Analog 4 input (voltage or current) 2 output (voltage or current)	SB CM01	2W	6ES7288-5AM06-0AA0
Temperature acquisition signal board	**describe**	**configuration**	**Power consumption**	**Order Number**
SB AR02-2PT100	Temperature collection 2 PT100	SB CM01	2W	6ES7288-5AR02-0AA0
SB AR04-4PT100	Temperature collection 4 PT100 (only supports 2-wire system)	SB CM01	2.5W	6ES7288-5AR04-0AA0
SB AN04-4NTC	Temperature acquisition 4-channel NTC (10K, 3950)	SB CM01	2W	6ES7288-5AN04-0AA0
SB AN06-4NTC2AI	Temperature acquisition 4-way NTC (10K, 3950) 2 inputs (only supports current)	SB CM01	2.5W	6ES7288-5AN06-0AA0
SB AT04-4TC	Temperature acquisition 4-way K-type thermocouple	SB CM01	2W	6ES7288-5AT04-0AA0

Note:SBCM01,SB CM02,SB DE02,SB QT02,SB DT04 The method of use is consistent with the original one.

2.Host use

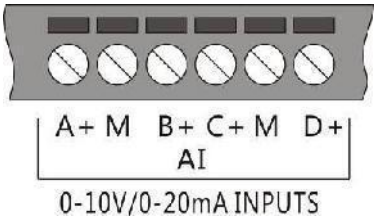
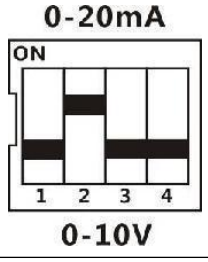
2.1The host comes with analog

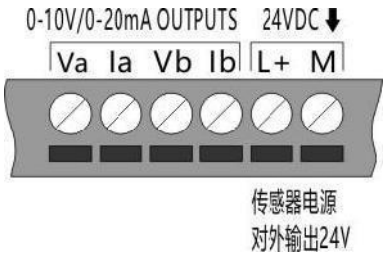
The host model with the suffix "XP" or "PRO" indicates that the host has built-in analog channels. The analog input start register address starts from AIW0. For example, the SR30XP host has 4 analog inputs, and the start addresses are AIW0, AIW2, AIW4, and AIW6. No configuration required Direct use . Register data range 0~27648, corresponding to 0~10V Or 0~20mA.

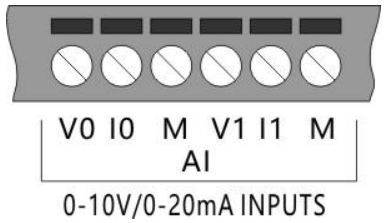
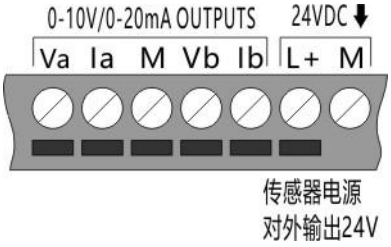
The analog output start register address starts from AQW0. No configuration required Direct use . For example, SR30XP main The machine has 2 analog outputs, and the starting addresses are AQW0 and AQW2. The register data range is 0~27648, corresponding to the output of 0~10V and 0~20mA. The maximum upper limit of the register value is 28200, corresponding to 20.4mA and 10.2V.

Analog filter coefficient: The analog quantity of the host can set the filter coefficient. For analog quantities that respond quickly, such as instantaneous pressure changes, the filter coefficient can be reduced. For those that require stable acquisition and strong anti-interference, such as temperature measurement, the filter coefficient can be increased. The filter coefficient is saved in special registers SMB1850~SMB1853. The value range is 0~3. 0 corresponds to the minimum filter and 3 corresponds to the longest time filter. The default value after restart is 2. Each register corresponds to a channel. Example: For the third analog input of SR30XP, different filtering degrees can be achieved by assigning SMB1852 to 0~3. Note: The register is not saved when the power is off, and the value needs to be assigned every time the power is on.

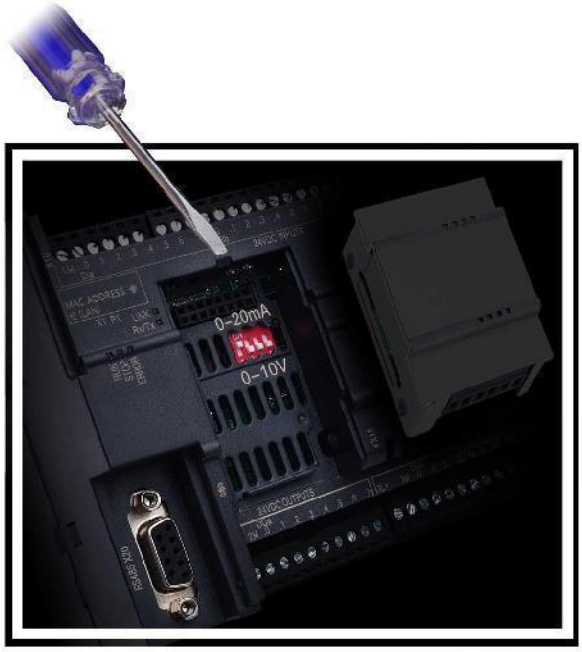
CR20XP,SR20XP,ST20XPmold Quasi-quantity terminal	Terminal Definition	Corresponding register
	V0: Analog input1aisle0-10Venter.	AIW0
	I0: Analog input1aisle0-20mAenter.	
	V1: Analog input2aisle0-10Venter.	AIW2
	I1: Analog input2aisle0-20mAenter.	
	V: Analog output0-10VOutput.	QUR
	Ia: Analog output0-20mAOutput.	
	L: Sensor output power24V+	
	M: Sensor output power24V-; Analog input common terminal; Analog output common terminal; These three are shared.	
	Note: The common end of analog input and output is the sensor power supply in the lower right corner. of M.	

SR20PRO,ST20PRO,CR30XP, SR30XP,ST30XPAnalog input	Terminal Definition	**Internal dial setting**
	A+: No.1aisle0-10V/0-20mAenter.	
	M: Analog input common terminal.	
	B+: No.2aisle0-10V/0-20mAenter;	
	C+: No.3aisle0-10V/0-20mAenter.	
	M: Analog input common terminal.	
	D+: No.4aisle0-10V/0-20mAenter;	
Analog input channel register address:AIW0,AIW2,AIW4,AIW6		

SR20PRO,ST20PRO,CR30XP, SR30XP,ST30XPAnalog output	**Terminal Definition**
	V: No.1aisle0-10VOutput.
	Ia: No.1aisle0-20mAOutput.
	Vb: No.2aisle0-10VOutput.
	Ib: No.2aisle0-20mAOutput.
	L+: Sensor power supply24V+, and export externally.
	M: Sensor power supply24V-, also used as the common terminal for analog output.
Analog output channel register address:QUR,AQW2	

SR40XP,ST40XPAnalog input	**Terminal Definition**
	V0: No.1aisle0-10Venter.
	I0: No.1aisle0-20mAenter.
	M: Analog input common terminal.
	V1: No.2aisle0-10Venter.
	I1: No.2aisle0-20mAenter.
	M: Analog input common terminal.
	Note: The same applies to other channels.
Analog input channel register address:AIW0,AIW2,AIW4,AIW6,AIW8,AIW10	
SR40XP,ST40XPAnalog output	**Terminal Definition**
	V: No.1aisle0-10VOutput.
	Ia: No.1aisle0-20mAOutput.
	M: Analog output common terminal.
	Vb: No.2aisle0-10VOutput.
	Ib: No.2aisle0-20mAOutput.
	L+: Sensor power supply24V+, and export externally.
	M: Sensor power supply24V-, and export externally.
Analog output channel register address:QUR,AQW2	

Note 1: Analog input channels support voltage or current input , For CR20XP, SR20XP and ST20XP, through Terminal wiring distinction. For SR20PRO, ST30PRO , CR30XP, SR30XP , ST30XP, through the DIP switch Setting, setting method: remove the signal board slot of the host, you can see the analog input dial, one dial corresponds to one analog channel, dial up is 0~20mA, dial down is 0~10V. As shown below.



Note: Analog output channels , By wiring terminal Come and Voltage current output , The same QUR Register Control .

2.2Host indicator status

Classification	Logo	color	meaning
PLC Running status Indicator Lights	RUN	green	Steady on: Running
	STOP	yellow	On: Stop; Flashing: There is a forced point
	ERROR	red	Steady on: Fault
Network port status Indicator Lights	LINK	green	Steady on: Connection established successfully
	Rx/Tx	yellow	Flashing: data is being sent or received

Indicator status	Common status analysis
STOP Yellow light is always on	① If the program does not run after downloading, click the RUN button in the S7 software; ② If it does not run after power-on, check the system block, start, and select RUN; ③ If the yellow light is on during operation, open the information table to check fatal and non-fatal errors; ④ If the S7 software does not run when you click the RUN button, check the system blocks, start, allow missing hardware, allow hardware configuration errors, and try again.
STOP Yellow light flashing	① If there are mandatory points, click Debug in the menu bar and click Cancel All Mandatory Points; ② The SD card is not removed
Three indicator lights flashing	① The power supply voltage is lower than 18V, check the power supply. ② Click the "Flashing Indicator Light" button on the communication interface

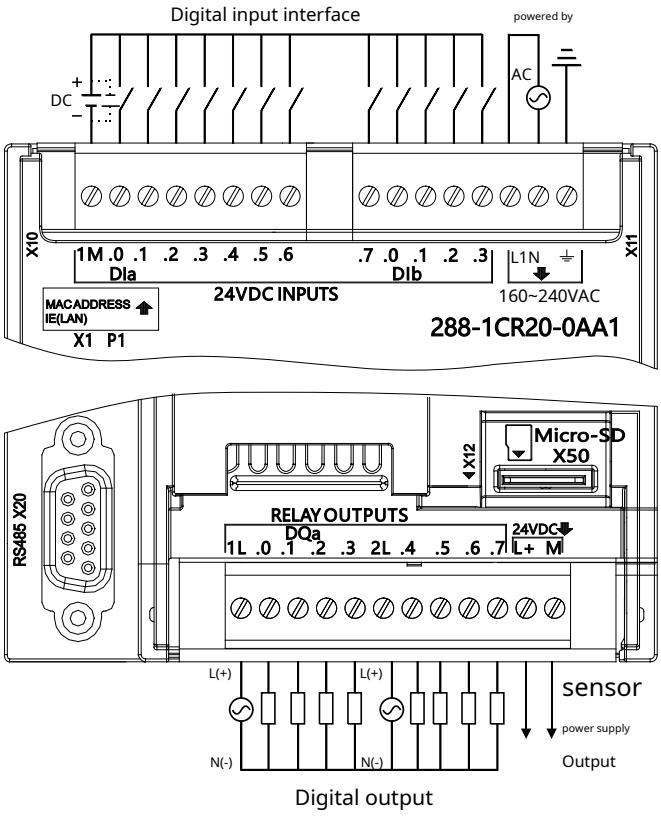
2.3Host technical parameters

model	CR20/ SR20/ ST20	CR20XP/ SR20XP/ ST20XP	SR20PRO/ ST20PRO	CR30/ SR30/ ST30	CR30XP/ SR30XP/ ST30XP	CR40/ SR40/ ST40	SR40XP /ST40XP	CR60/ SR60/ ST60
Configuration selection	SR20/ST20	SR20/ST20	SR20/ST20	SR30/ST30	SR30/ST30	SR40/ST40	SR40/ST40	SR60/ST60
Power consumption	12W/10W	14W/12W	16W/14W	14W/12W	18W/15W	23W/18W	27W/22W	30W/25W
Program Space	12KB			18KB		24KB		30KB
Data Space	12KB			16KB		20KB		24KB
Keep storage area	Maximum 12KB							
Supply voltage	SR relay type power supply range 160~260VAC, ST transistor type power supply range 20~28VDC							
Process Mapping	I zone range is I0.0-I1279.7; Q zone range is Q0.0-Q1279.7;							
Analog mapping	56 characters AI/56 characters AQ							
Dimensions (mm)	90x100x81		110x100x81		125x100x81		175x100x81	
IO digital quantity								
Onboard digital quantity	12 in 8 out			18 in 12 out		24 in 16 out		36 in 24 out
Input Type	Sink/source bipolar; Rated voltage 24VDC, 4mA; Maximum continuous allowable voltage 30VDC							
Logic Input	Logic 1 minimum 16V. Logic 0 maximum 5V							
Output format	SR: Relay type, ST: Transistor type							
Output Type	Transistor: source type (can output 24V+ and disconnect 24V+, cannot output 0V); Relay: dry contact.							
Output Current	The maximum resistive load of the transistor is 0.5A (16W), and the inductive load is 0.2A (5W); the maximum resistive load of the relay is 2A, and the inductive load is 0.5A;							
Mechanical life	Transistor type has no life limit; relay type has 100,000 opening and closing times							
High-speed counting	Single phase: 4 channels 100KHz; 2 channels 30KHz			Single phase: 5 channels 100KHz; 1 channel 30KHz				
	A/B phase: 2 channels 100KHz; 2 channels 30KHz			A/B phase: 3 channels 100KHz; 1 channel 30KHz				
	I0.0~I0.3 are 100KHz high-speed ports, and the rest are low-speed ports			I0.0~I0.3 and I0.6, I0.7 are 100KHz high-speed ports, and the rest are low-speed ports.				
Pulse output	2 channels (transistor only): maximum 100KHz			3-way (transistor only): maximum 100KHz				
Interface and functionality								
Network port specifications	1-way 10M/100M adaptive, supports S7 Ethernet protocol; Modbus TCP protocol; TCP free port protocol;							
Number of network port connections	A maximum of 6 connections are supported, and all protocol connections share these 6 connections.							
485 interface	It comes with 1 channel, supports PPI protocol; Modbus RTU protocol; 485 free port protocol; supports 9.6K, 19.2k and 187.5kbps baud rate; adding signal board SB CM01 or SB CM02 can expand 1 more 485 interface or 232 interface, also supports the above protocols.							
Extension modules	CR series does not support expansion modules; SR/T series supports original modules or Gongbei Smart standard expansion modules. A maximum of 12 modules are supported. Please refer to the expansion module usage section.							
signal board	Supports all series of Gongbei signal boards, and only supports Xizi SB CM01 and SB DT04 signal boards.							
Memory Card	Supports microSDHC cards (purchased separately)							
Real-time clock	Built-in, replaceable, button battery, not rechargeable; the device is powered off and the retention time is about 1 year; the device does not consume battery power when powered on; the clock will revert to 2000.01.01 if the battery fails;							
encryption	It supports 4 levels of encryption. Because the password storage location is different from the original one, it cannot be cracked using the original cracking method, which is safer.							
Lower right corner sensor Output power	When the host has 6 expansion modules: the maximum output power is 10W When the host has 12 expansion modules: the output power is 0W (no additional output is possible)							

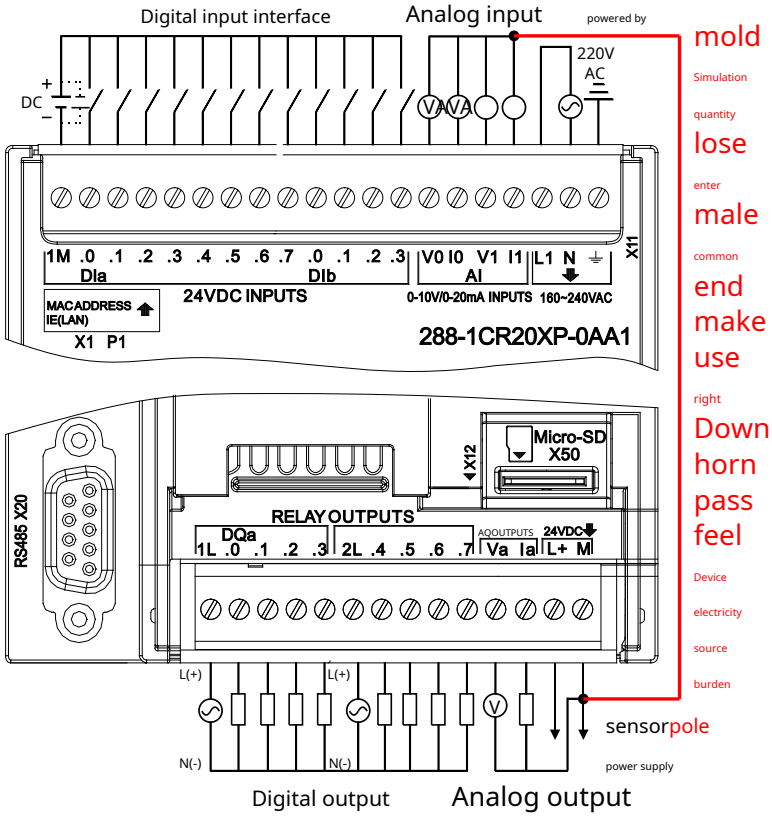
The host has built-in analog quantity (Note: only the models with suffix XP and PRO have built-in analog quantity)				
model	CR20XP/SR20XP/ST20XP	SR20PRO/ST20PRO	CR30XP/SR30XP/ST30XP	SR40XP/ST40XP
Analog input channel	2 inputs	4 inputs	4 inputs	6 inputs

Analog input mode	Non-differential			
Analog input signal	0~10V or 0~20mA			
Analog input data format	0~27648			
Analog input impedance	Voltage: 30K, Current: 150Ω,			
Analog input resolution	12 bits			
Analog input error	Maximum: ±1% of full scale			
Analog input conversion time	100ms			
Analog output channels	1 way	2-way	2-way	2-way
Analog output signal	0~10V and 0~20mA			
Analog output data format	0~27648 The maximum assignable value is 28200, corresponding to 20.4mA and 10.2V			
Analog output load capacity	Voltage: >5KΩ, Current: <500Ω			

2.4Host wiring diagram

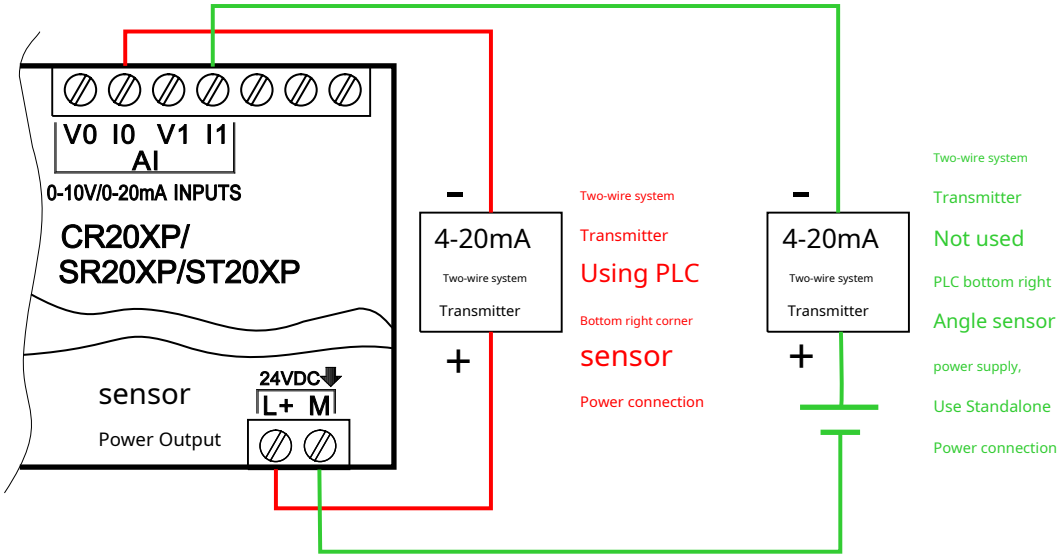


CR20 (relay) wiring diagram

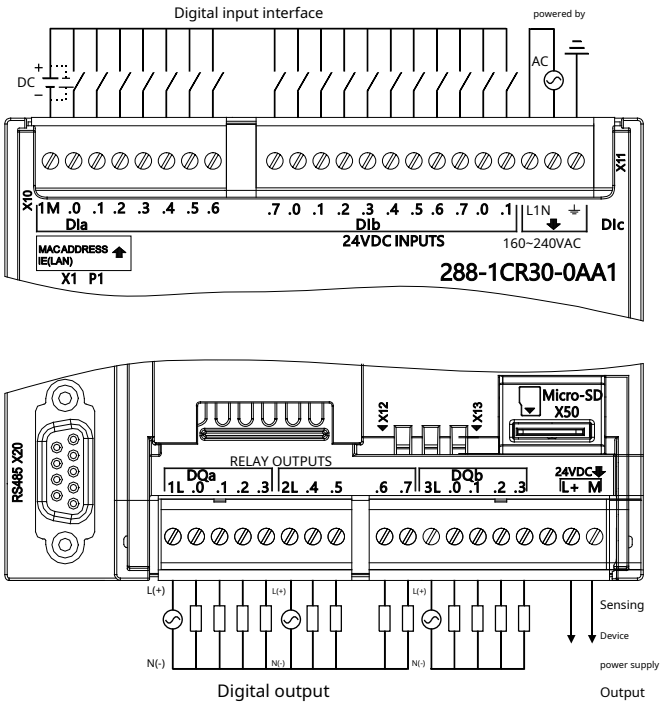


CR20XP (relay) wiring diagram

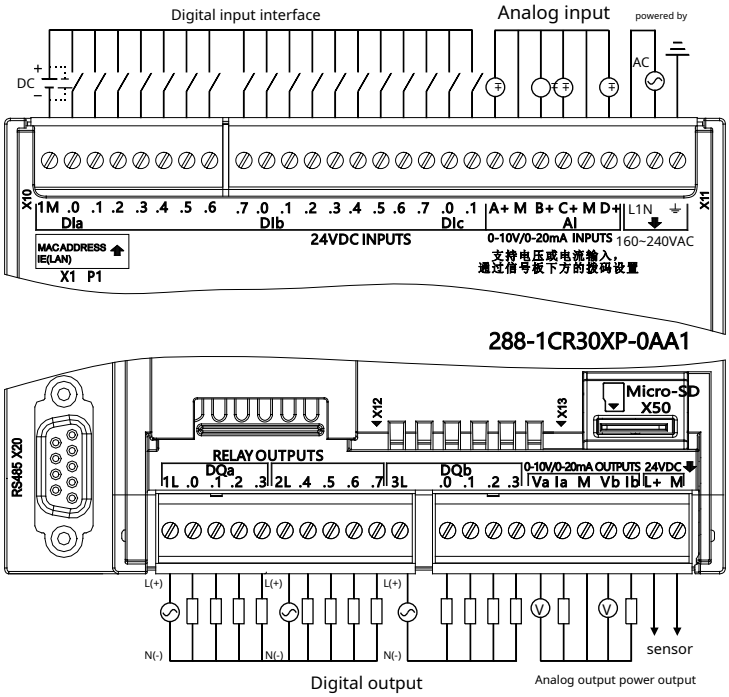
mold
Simulation
quantity
lose
enter
male
common
end
make
use
right
Down
horn
pass
feel
Device
electricity
source
burden



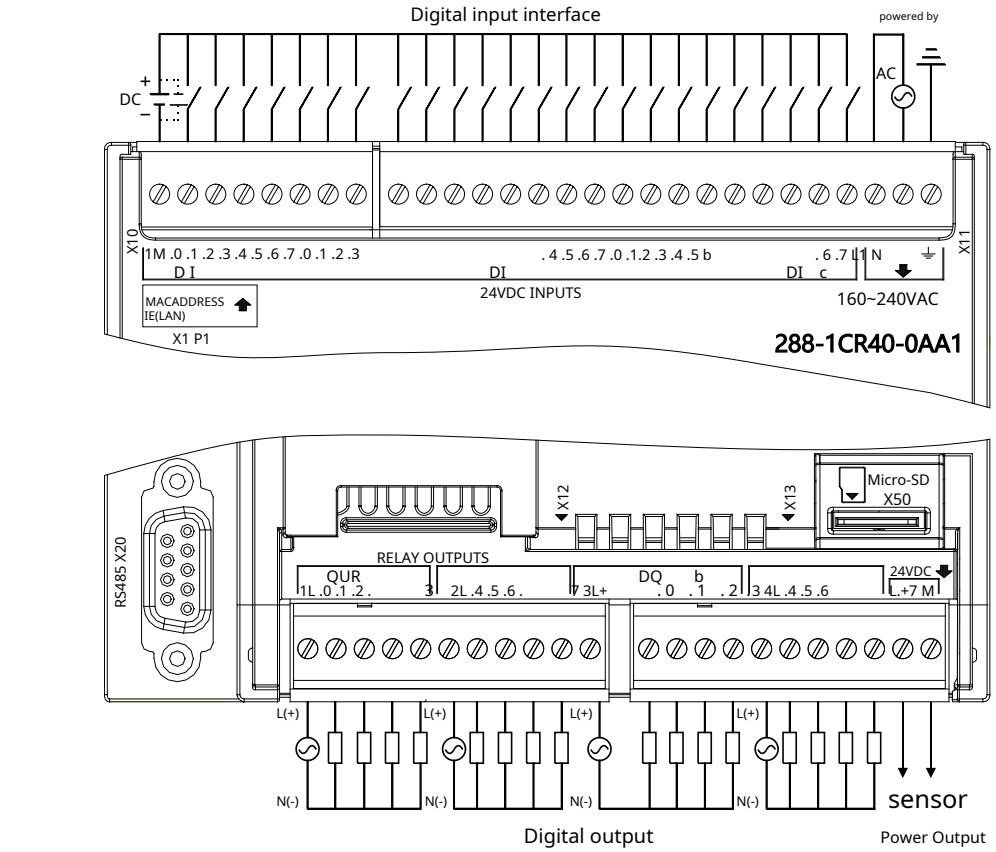
CR20XP/SR20XP/ST20XP transmitter connection



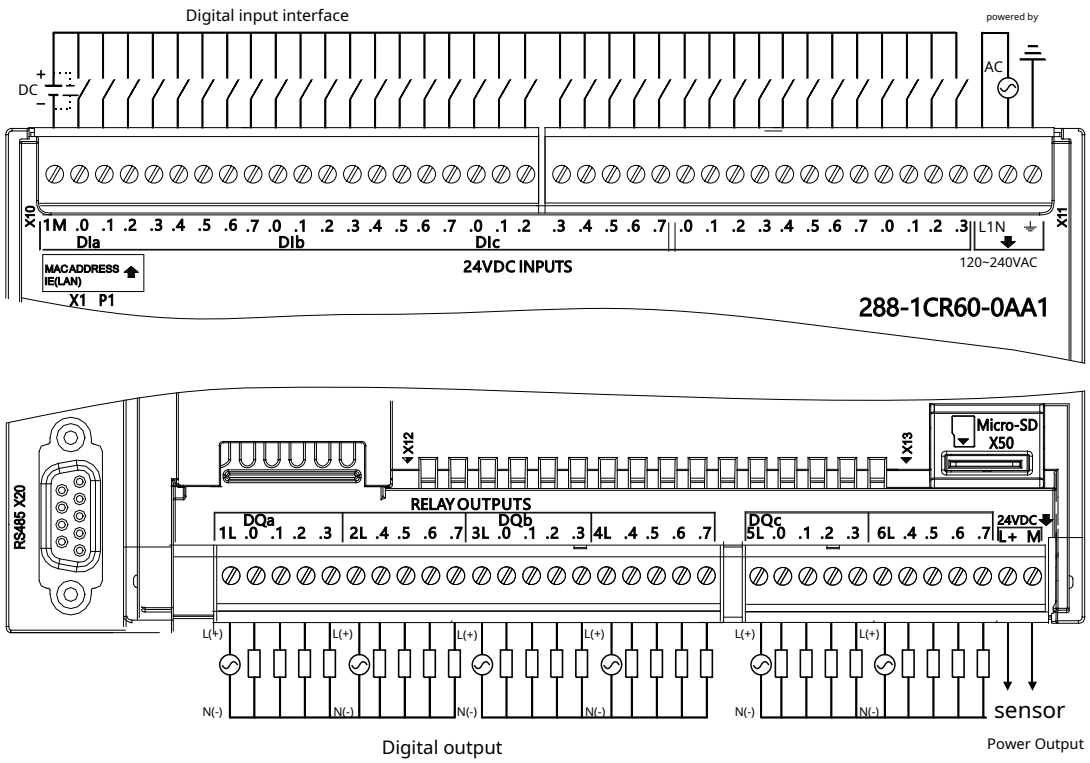
CR30 (relay) wiring diagram



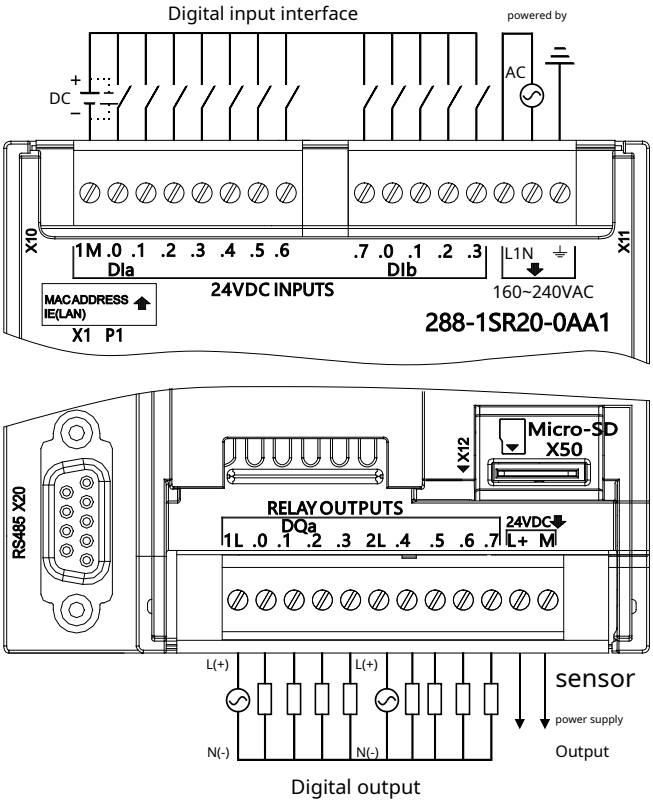
CR30XP (relay) wiring diagram



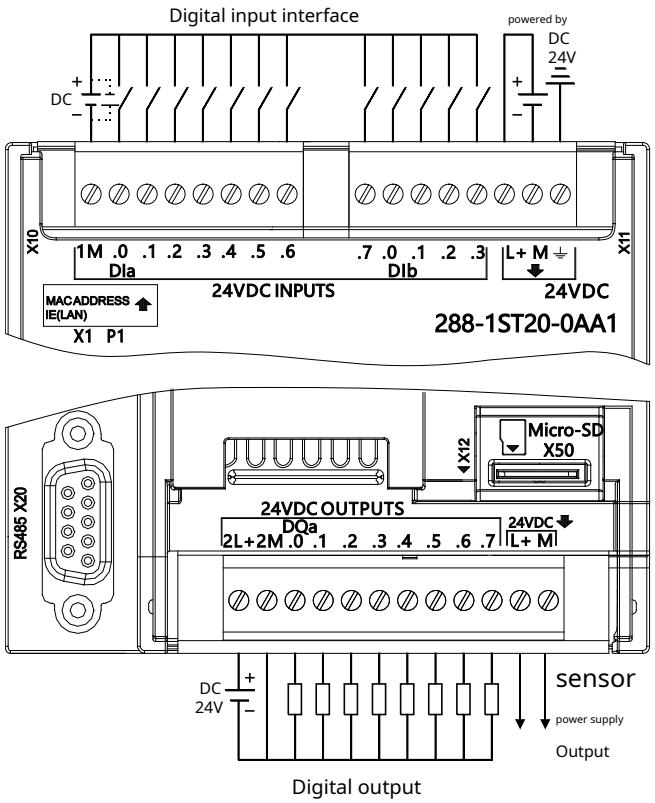
CR40 (relay) wiring diagram



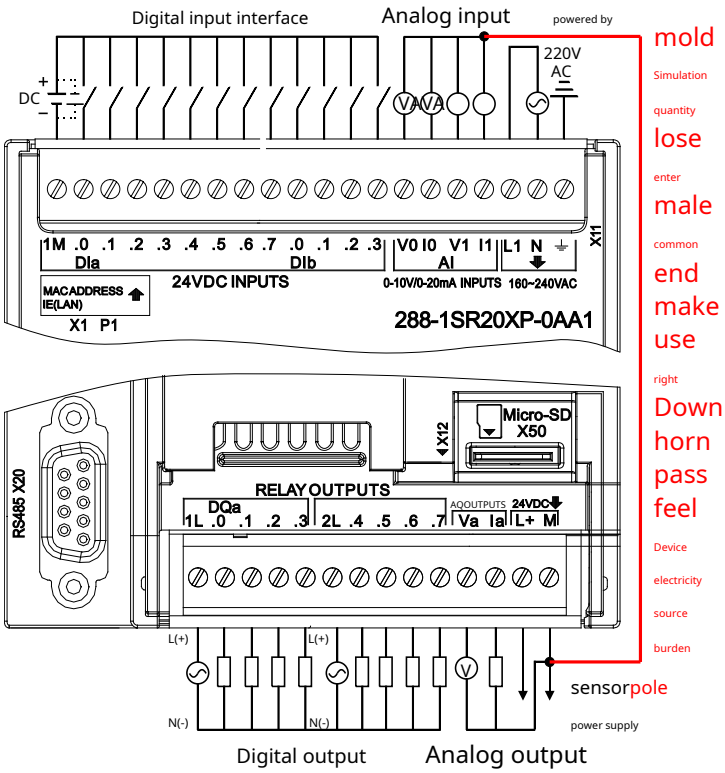
CR60 (relay) wiring diagram

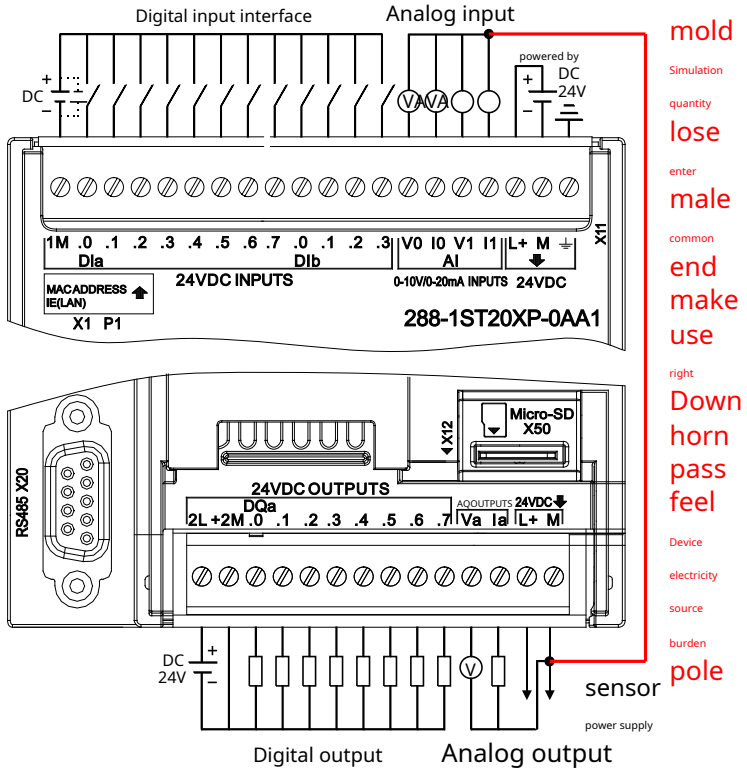


SR20 (relay) wiring diagram

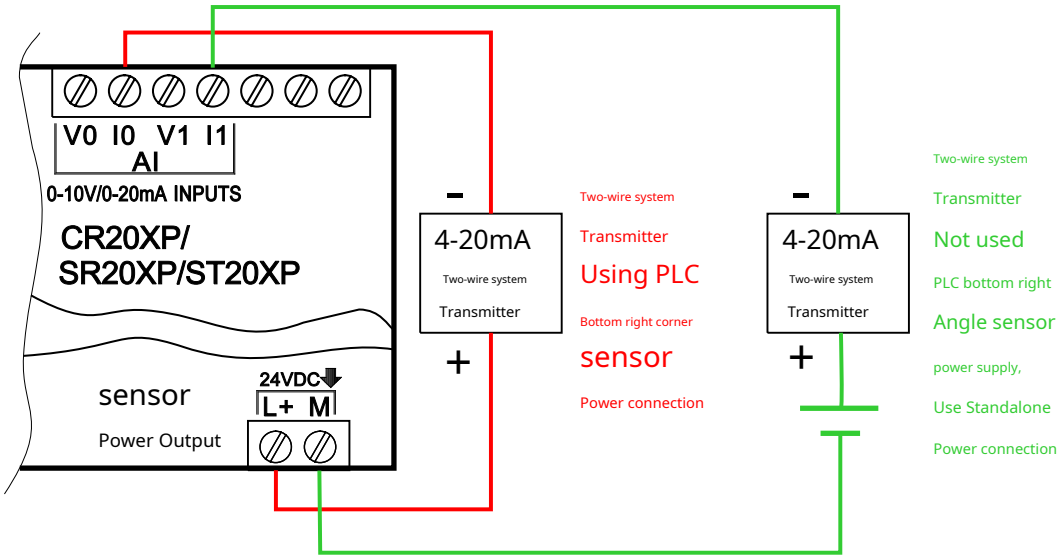


ST20 (transistor) wiring diagram

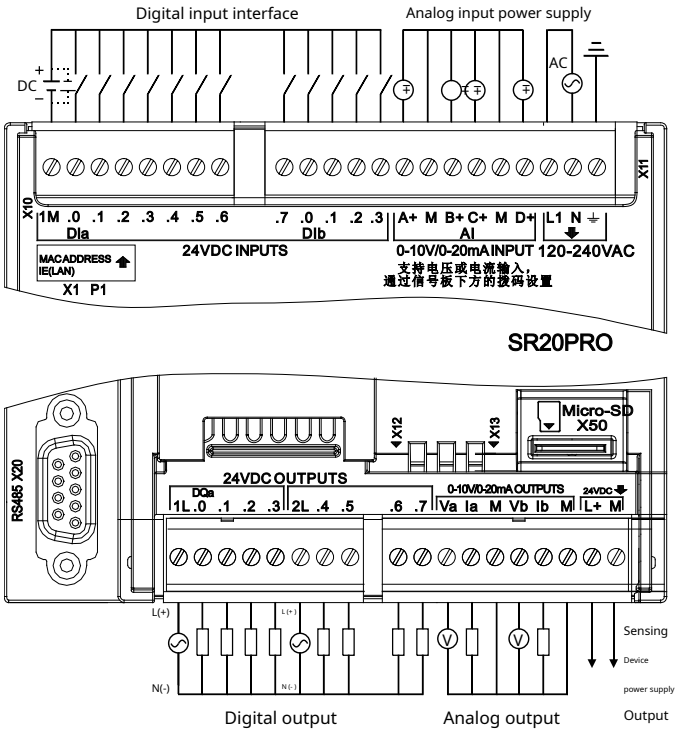




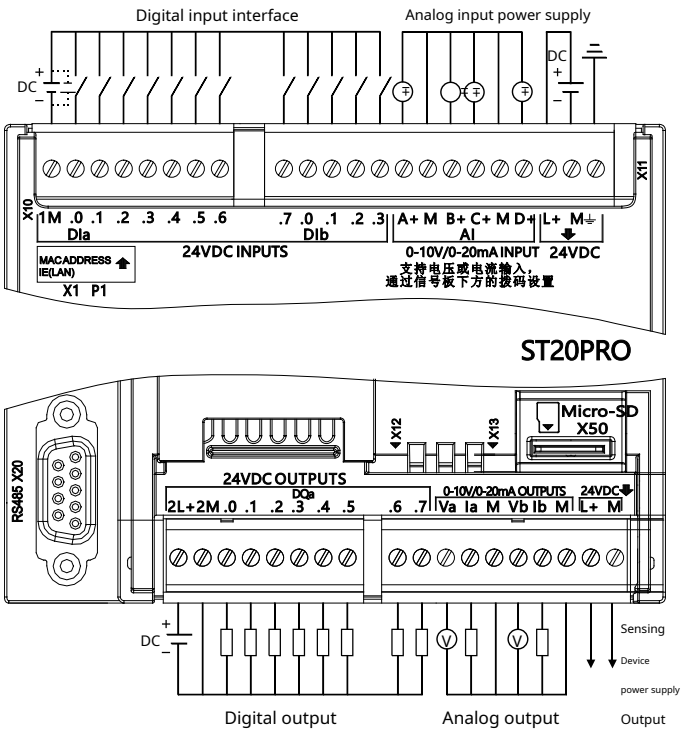
SR20XP (Relay, with 2 inputs and 1 output analog quantity - refer to Section 2.1 for use) ST20XP (Transistor, with 2 inputs and 1 output analog quantity - refer to Section 2.1 for use)



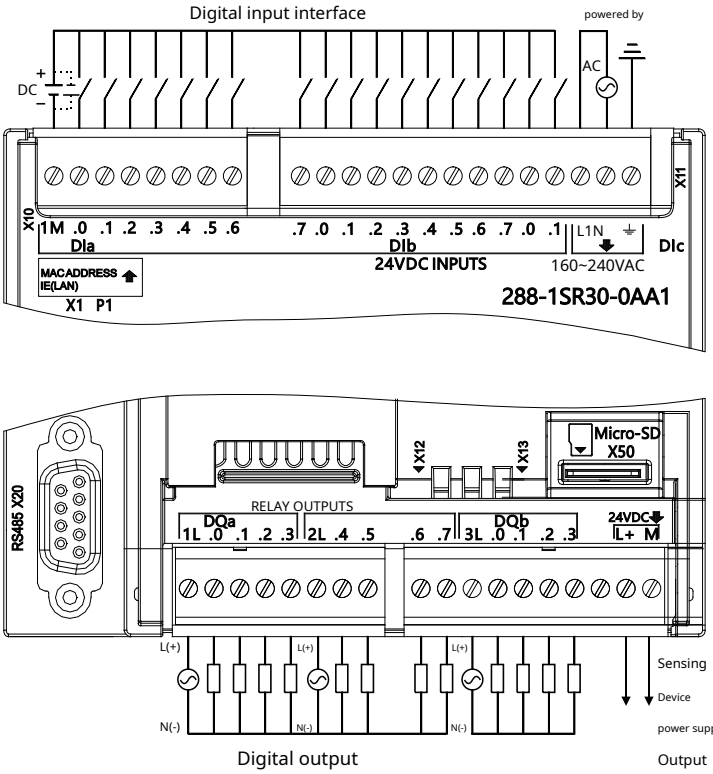
CR20XP/SR20XP/ST20XP transmitter connection



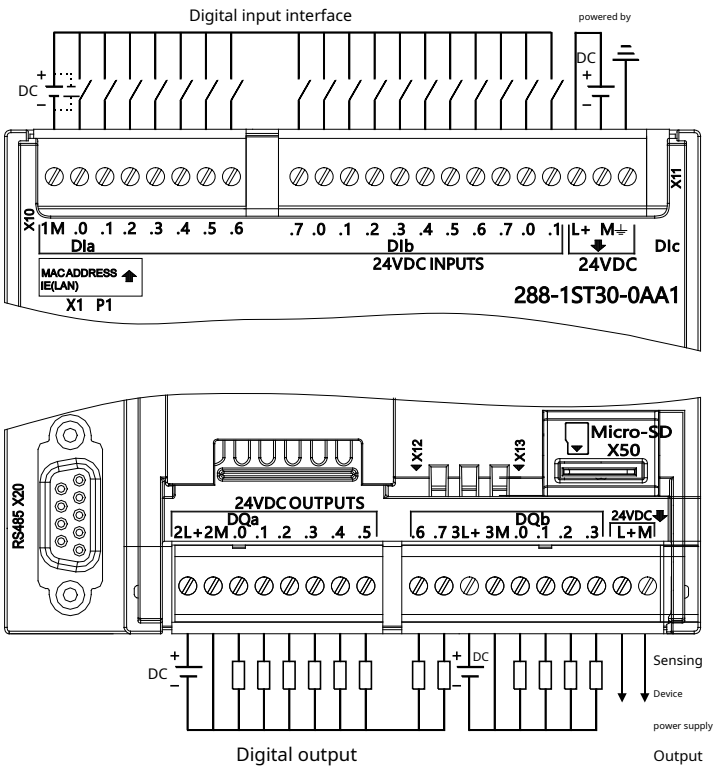
SR20PRO (Relay, with 4 input and 2 output analog quantity - refer to Section 2.1 for usage)



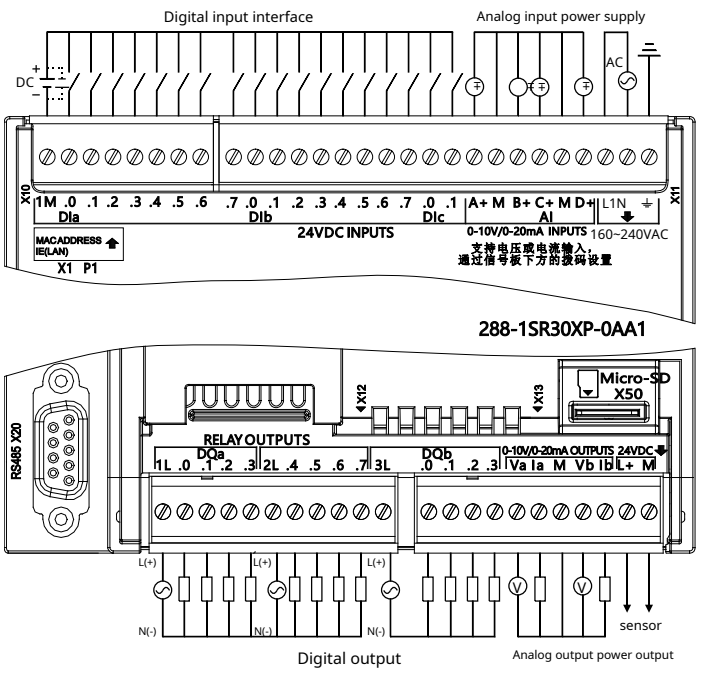
ST20PRO (transistor, with 4 input and 2 output analog quantity - refer to Section 2.1 for usage)

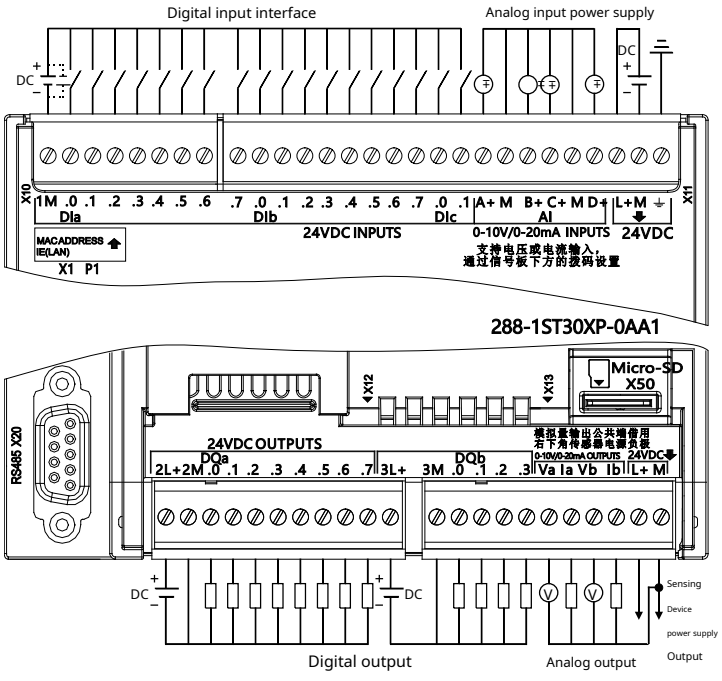


SR30 (Relay)

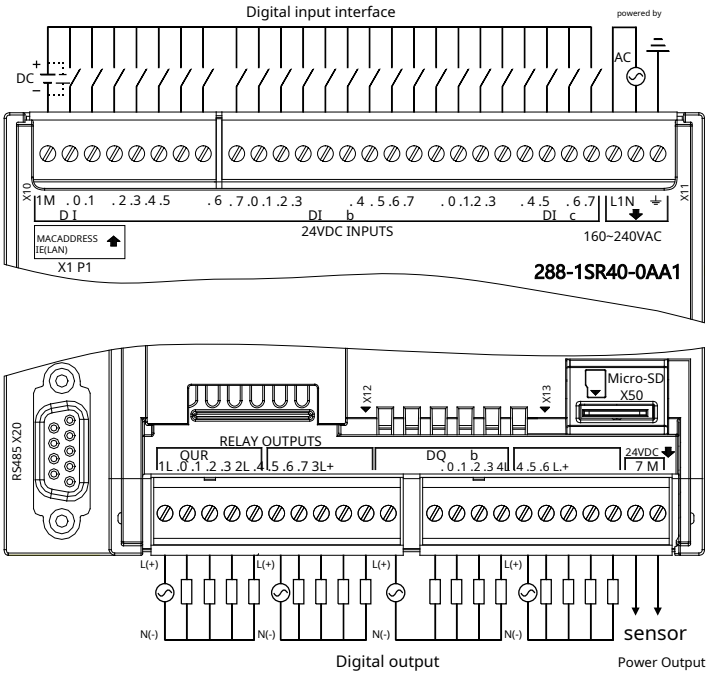


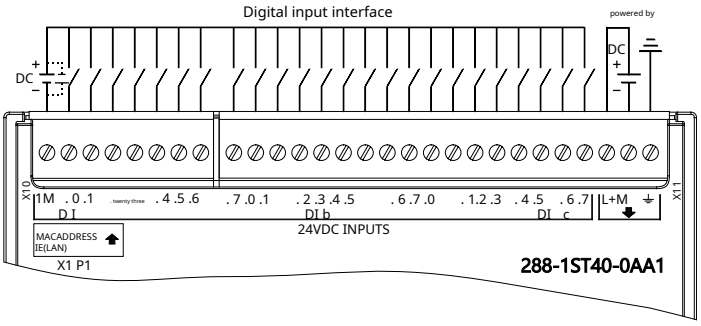
ST30 (transistor)

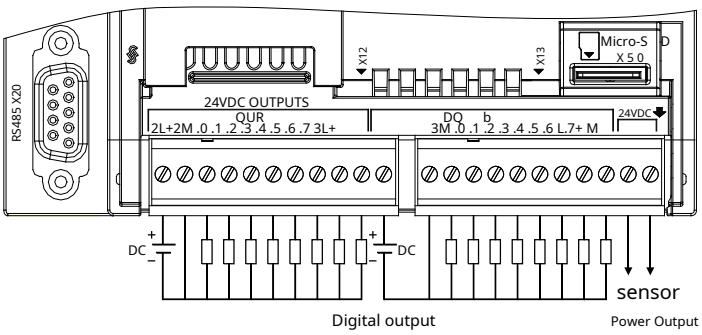




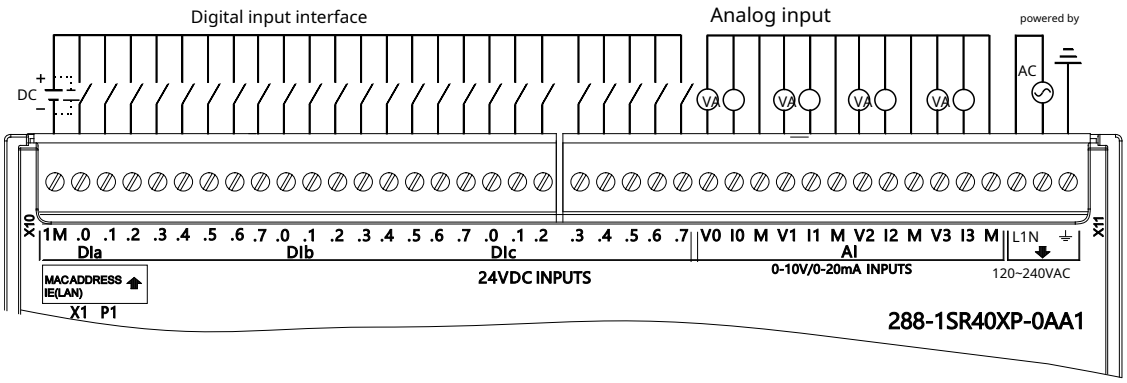
SR30XP (Relay, with 4 input and 2 output analog quantity - refer to Section 2.1 for use) ST30XP (Transistor, with 4 input and 2 output analog quantity - refer to Section 2.1 for use)

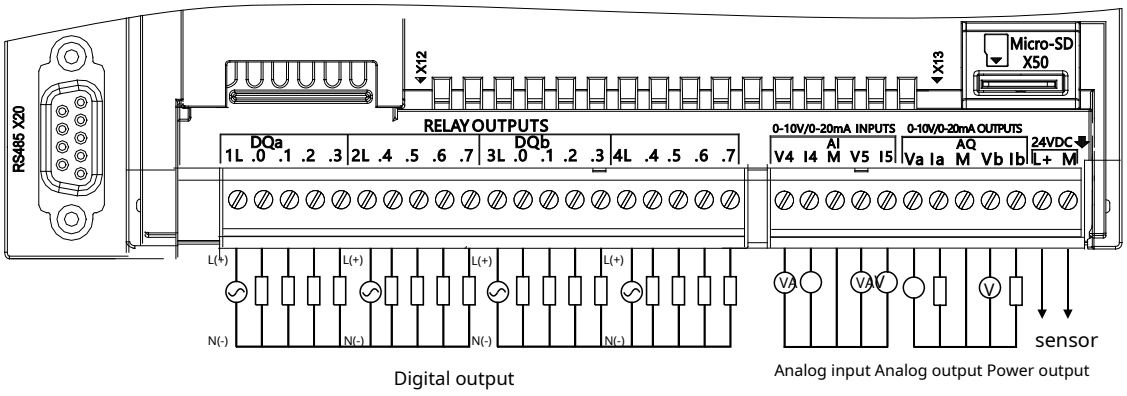




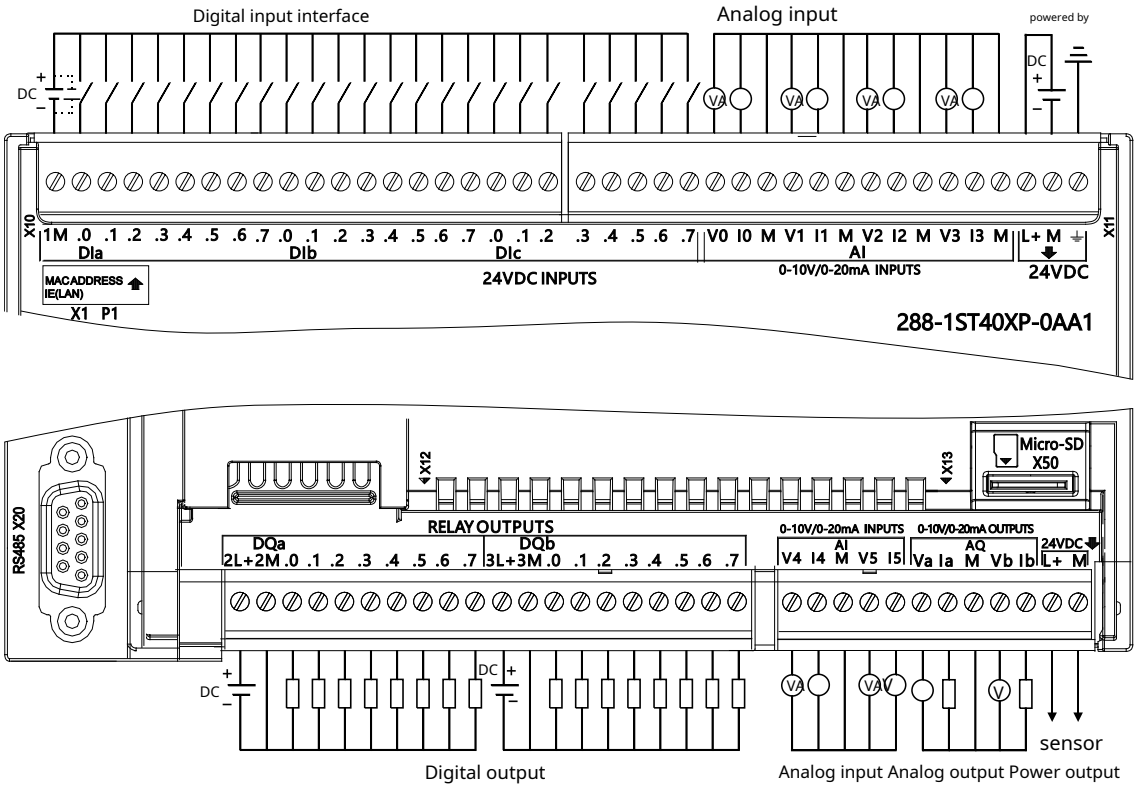


SR40 (Relay) **ST40 (transistor)**

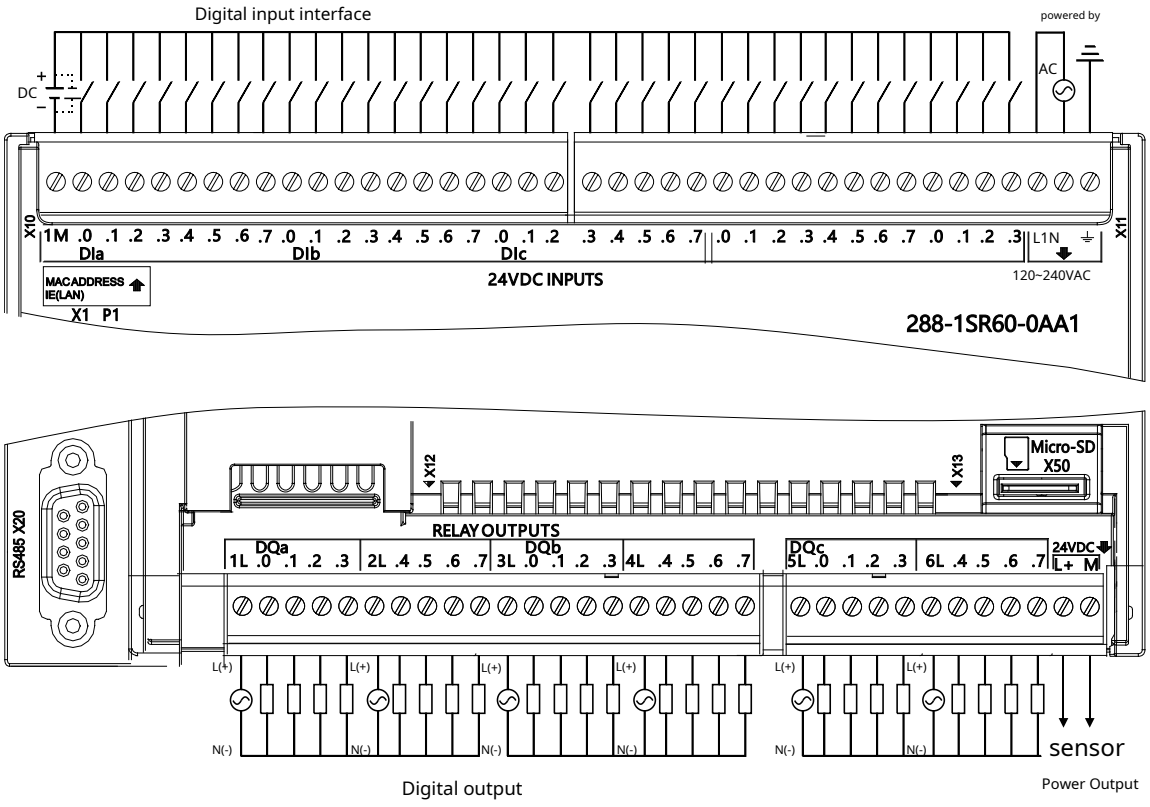




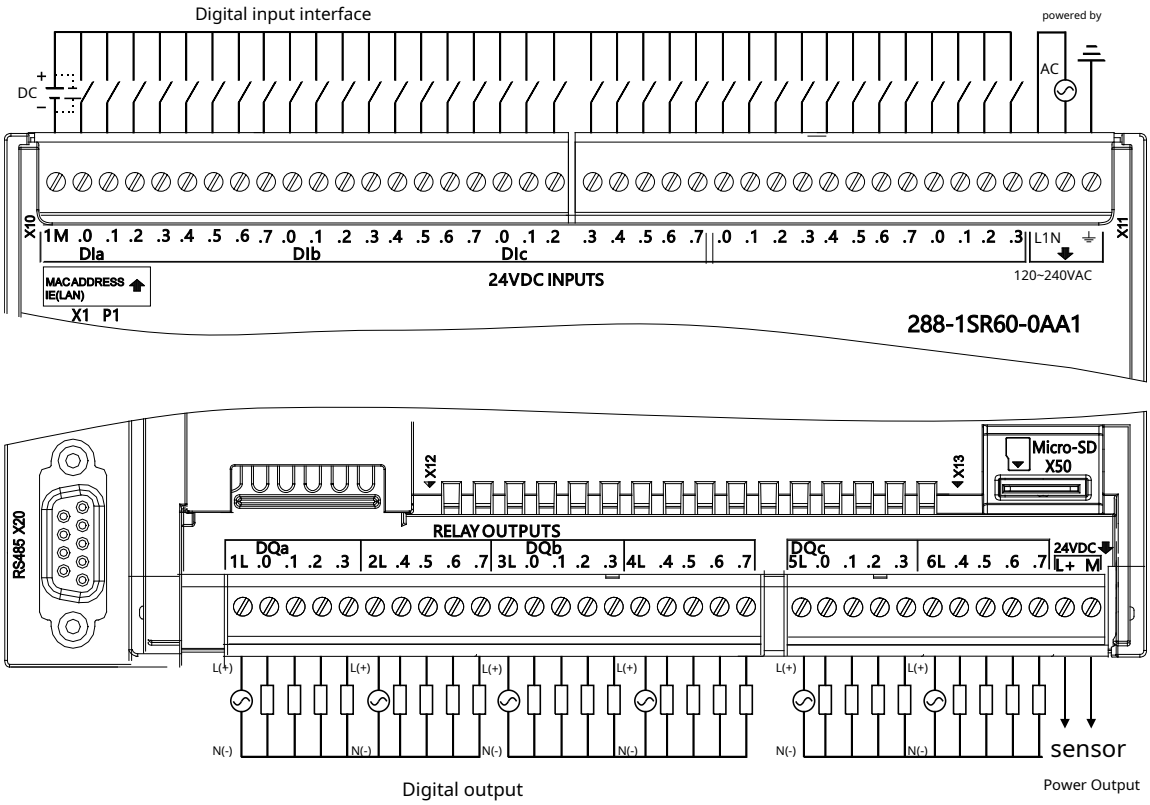
SR40XP (Relay, with 6 input and 2 output analog quantity - refer to Section 2.1 for usage)



ST40XP (transistor, with 6 input and 2 output analog quantity - refer to Section 2.1 for usage)



SR60 (Relay)



ST60 (transistor)

2.5Frequently asked questions

2.5.1 Does the Gongbei Smart host support direct connection with the original Smart module or signal board? A: It can be directly connected to all Smart original modules; the signal board only supports original SB CM01 and SB DT04, and does not support others.

2.5.2 Does Smart support power-off data preservation? How long can it be preserved? What is the data retention range? A: Like Xizi, both support permanent storage. The maximum storage capacity is 10240 (10K) bytes. If the value exceeds the range during configuration, an error will be reported.

2.5.3 How long can the Smart real-time clock stay in standby mode? Answer: It is powered by a built-in battery with a standby time of more than one year. If it runs out of power, you can replace the battery.

2.5.3 The STOP indicator light on the Smart host flashes? Answer: 1. There may be some forced functions, try to cancel all forced functions. 2. Check if the SD card is plugged in.

3.Extension module usage

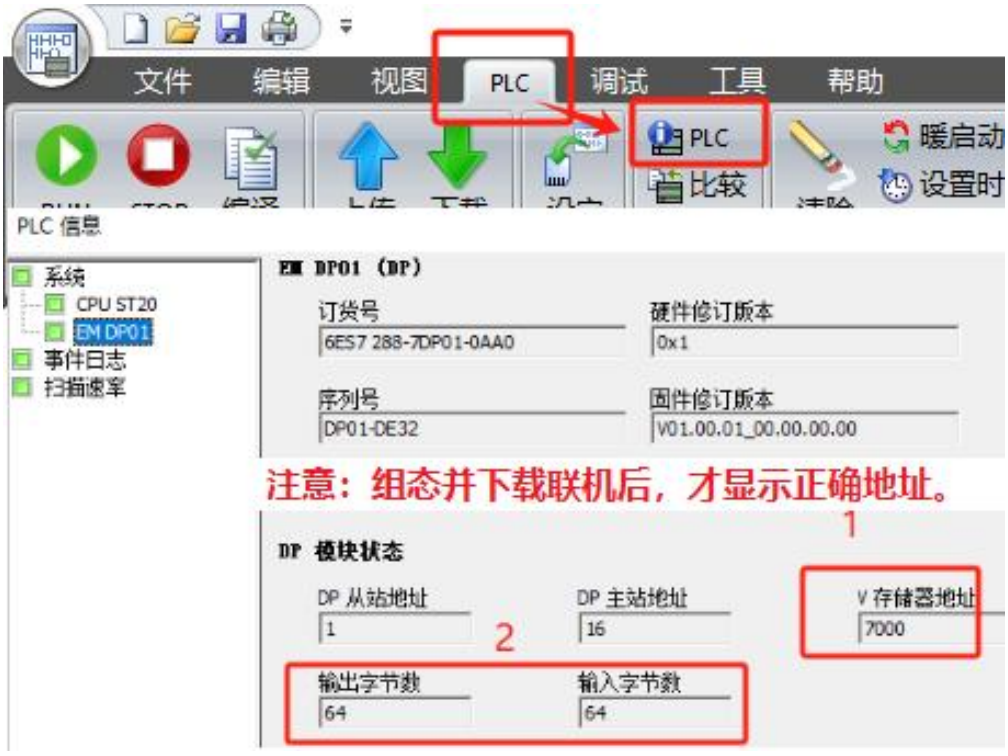
Gongbei expansion modules are perfectly compatible with Xizi expansion modules and are compatible with Xizi hosts (includingV3 Therefore, the Xizi host or Gongbei host can be connected with the Xizi expansion module or Gongbei expansion module at will.CR The series host does not support the right expansion module.

Compared with Xizi modules, Gongbei expansion modules have more models and richer types, such asEM AE32(32analog input module), this module is called a large point module, which only needs to be configured asEM DP01Ready to use, very simple.

model	type	Configuration selection	model	Module Type	Configuration selection	model	Module Type	Configuration selection
EM DE08	Standard modules	EM DE08	EM DT16	Standard modules	EM DT16	EM AM12	Large point module	EM DP01
EM DE16	Standard modules	EM DE16	EM DT32	Standard modules	EM DT32	EM AM16	Large point module	EM DP01
EM DE32	Large point module	EM DP01	EM AE04	Standard modules	EM AE04	EM AR02	Standard modules	EM AR02
EM DR08	Standard modules	EM DR08	EM AE08	Standard modules	EM AE08	EM AR04	Standard modules	EM AR04
EM QR16	Standard modules	EM QR16	EM AE16	Large point module	EM DP01	EM AR08	Standard modules	EM AE08
EM QR32	Large point module	EM DP01	EM AE32	Large point module	EM DP01	EM AN16	Large point module	EM DP01
EM DT08	Standard modules	EM DT08	EM AQ02	Standard modules	EM AQ02	EM AT04	Standard modules	EM AT04
EM QT16	Standard modules	EM QT16	EM AQ04	Standard modules	EM AQ04	EM AT08	Standard modules	EM AE08
EM QT32	Large point module	EM DP01	EM AQ08	Large point module	EM DP01	EM EN88	Large point module	EM DP01
EM DR16	Standard modules	EM DR16	EM AM03	Standard modules	EM AM03	EM EN4C	Large point module	EM DP01
EM DR32	Standard modules	EM DR32	EM AM06	Standard modules	EM AM06			

3.1Large point expansion module

Gongbei big points module resources are mapped toVThe starting address is automatically assigned.6Slot configurationEM DP01, the starting address can bePLCInformation table (menu bar pointPLC, toolbar pointPLC). Take the following figure as an example.



Marked on the picture1The starting address of the module resources is shown in the figure above.2The number of bytes occupied by input and output resources is shown here, and**It is stipulated that the input resources are in front and the output resources are in the back.**So input resource usage64Bytes (VB7000~VB7063), the output resources are occupied64Bytes (VB7064~VB7127).

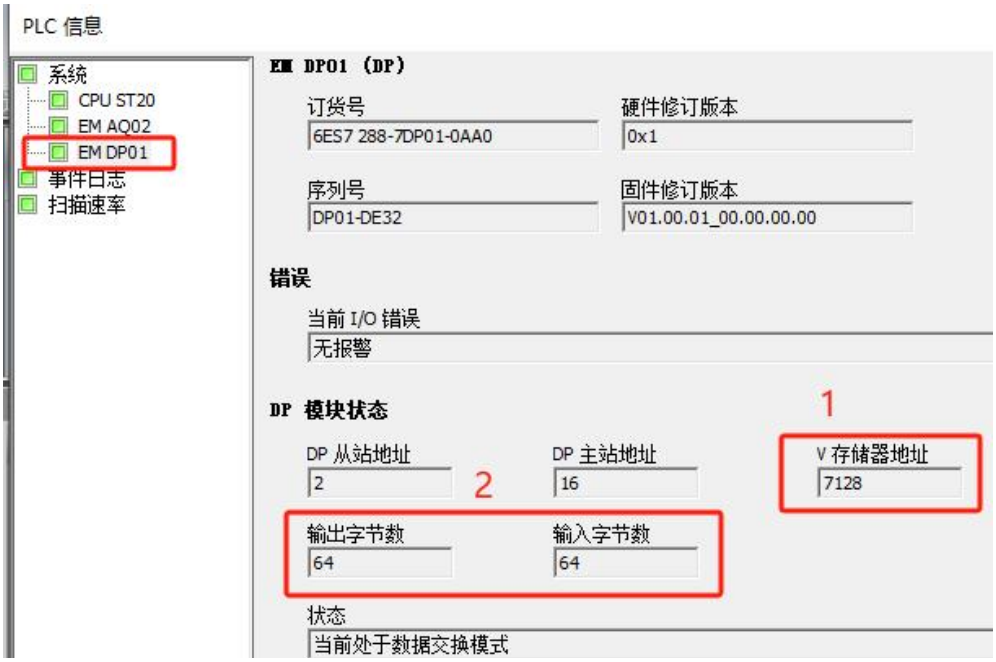
Assume that the above figure isEM QT32(32The output channel addresses areV7064.0, V7064.1……V7067.7, the programV7064.0Assignment1,butEM QT32The first transistor output.

Assume that the above figure isEM AM12(8enter4Output analog) module, the analog input channel addresses are:VW7000, VW7002……VW7014The output channel addresses are:VW7064……VW7070.VW7064Assignment 13824, then the first analog output is half scale5Vand10mA. Use a signal generator toEM AM12The second analog input 20mA, read registerVW7002for27648.

Note: Gongbei host can be expanded to the maximum 12 modules, both standard and large number modules are available. Standard module position Set greater than6When the high-point module is in different slots, the starting address is fixed, as shown in the following table.

Slot Number	V Zone Memory Starting address	Digital Module		Analog or temperature module	
		Input channel start address	Output channel start address	Input channel start address	Output channel start address
EM0	VB7000	V7000.0	V7064.0	VW7000	VW7064
EM1	VB7128	V7128.0	V7192.0	VW7128	VW7192
EM2	VB7256	V7256.0	V7320.0	VW7256	VW7320
EM3	VB7384	V7384.0	V7448.0	VW7384	VW7448
EM4	VB7512	V7512.0	V7576.0	VW7512	VW7576
EM5	VB7640	V7640.0	V7704.0	VW7640	VW7704
EM6	VB7768	V7768.0	V7832.0	VW7768	VW7832
EM7	VB7896	V7896.0	V7960.0	VW7896	VW7960
EM8	VB8024	V8024.0	V8088.0	VW8024	VW8088
EM9	VB8152	V8152.0	V8216.0	VW8152	VW8216
EM10	VB8280	V8280.0	V8344.0	VW8280	VW8344
EM11	VB8408	V8408.0	V8472.0	VW8408	VW8472

From the table above, we can see that each high-point module occupies 128 bytes of V area, and the address is fixed according to the slot number. For example: EM0 is a common module, and EM1 is a high-point module. Then the high-point module does not start from VB7000, but from VB7128, as shown in the figure below.



Another example: SR20 + EM DE08 + EM EN88 + EM AM06 + EM DE32, a total of 4 expansions. EM EN88 is the EM1 slot number, occupying the first 128 bytes of VB7128, the analog input channels are VW7128, VW7130.....VW7142, and the temperature input channels are VW7144, VW7146.....VW7158.

EM DE32 is the slot number of EM3, occupying the first 128 bytes of VB7384. The digital input channels are V7384.0, V7384.1.....V7387.7.

illustrate 1: The starting address of the large point module is automatically allocated and cannot be modified, The starting address can be obtained by looking at the table aboveSlot number in front 6 You can also quickly view the information table at any time.

illustrate 2: For large number of modules V District Address , Cannot be used for other purposes in the program , The unoccupied areas can be Easy to use.

3.2Standard expansion modules

When the standard module is mounted in the first 6 slots, it can be configured directly in the status table. The same as the original usage method, support channel type configuration and filter configuration, this article will not repeat. (Note: EM AR08 and EM AT08 are configured for EM AE08 use, according to the address in the system block.)

Note: Gongbei host can be expanded to the maximum 12 modules, both standard and large number modules are available. Large point model Block position greater than6When the standard module position is greater than the 6th slot, the resource addresses are compactly arranged as shown in the following table.

Special registers		Switch input channel		Switching output channel	
IW630	Reserve	1st channel	I700.0	1st channel	Q700.0
IW632	Diagnostic alarm codes	2nd channel	I700.1	2nd channel	Q700.1
IB634	Diagnostic alarm device ID	.....		.....	
IB635	Disconnection error device ID	Channel 256	I731.7	Channel 256	Q731.7
ID636	Module 7 Model (Data Type				

	Type ASCII)				
ID640	Module 8 Model	Analog input or temperature channel		Analog output channels	
ID644	Module 9 Model	1st channel	IW800	1st channel	QW800
ID648	Module 10 Model	2nd channel	IW802	2nd channel	QW802
ID652	Module 11 Model	.....		.....	
ID656	Module 12 Model	Channel 128	IW1054	Channel 128	QW1054

Note 1: I, Q How big is the area? 2.8 The firmware version is the same. I District Largest IB1279, QB1279.

Note 2: For a partial explanation of the special registers, see the FAQ section at the end of the article.

Note 3: For slots 6 Future expansion modules, Maximum number of digital input points 256; Digital output 256 point; mold Pseudo input 128 Point; analog output 128 points; because the large point module does not occupy I, Q area, so do not consider the large Limitations of the Points Module.

For example: Gongbei SR20 + 6 modules + EM DE08 (8-input digital quantity) + EM AE16 (16-input analog quantity) + EM AM06 (4-input 2-output analog quantity) + EM DR16 (8-input 8-output digital quantity) + EM AQ02 (2-output analog quantity), a total of 11 modules, the starting addresses of the first 6 modules are obtained in the configuration table, and will not be repeated here.

EM DE08 digital input channel addresses are I700.0, I700.1.....I700.7; EM AM16 is a large point module that does not occupy I, Q area, and the starting address is fixed to VW7896;

EM AM06 analog input channel addresses are IW800, IW802.....IW806;

The analog output channel addresses are QW800, QW802;

The digital input channel addresses of EM DR16 are I701.0, I701.1...I701.7;

The digital output channel addresses are Q700.0, Q700.1...Q700.7;

The EM AQ02 analog output channel addresses are QW804, QW806;

Note 1: When the standard module is installed after the 6th slot, the input, channel configuration cannot be performed in the system block, so the analog and output modules can only use the default channel settings. , The default is current input channel or current output channel. For modules with voltage input or output requirements, they should be placed in the front 6 slots. But for wiring to distinguish channels Modules of type are not affected, such as EM AE16, all channels support voltage or current wiring distinction, so put In slot 6 It will not be affected in the future.

3.3Expansion module technical parameters

Digital Module	EM DE08/16/32	EM DR08/ QR16/QR32	EM DT08/ QT16/QT32	EM DR16/DR32	EM DT16/DT32
Configuration Model	EM DE08/16/DP01	EM DR08/ QR16/DP01	EM DT08/ QT16/DP01	EM DR16/DR32	EM DT16/DT32
Number of channels	8/16/32 Enter	8/16/32 Relay out	8/16/32 Transistor out	8 in 8 out/16 in 16 out Output relay	8 in 8 out/16 in 16 Output transistor
Digital input type	Sink type or source type (supports bidirectional input, common terminal can be positive or negative)				
Digital input voltage	Logic 1 minimum voltage: 15VDC at 2.5mA				

	Logic 0 maximum voltage: 5VDC at 1ma
Digital input isolation	Internal photoelectric isolation
Maximum output current	The transistor can carry a maximum of 0.5A (16W) with a resistive load and 0.2A (5W) with an inductive load; The maximum resistive load of the relay is 2A, and the inductive load is 0.5A;
Output common Rated current	Transistor 3A Relay 8A
Digital output isolation	Internal photoelectric isolation
L+,M Rated voltage	24 V DC at 4 mA (30 VDC max)
DIAG indicator	Solid green: The module is configured and has no errors. Flashing green: The module is not configured. Flashing red: Communication with the host is abnormal (unplug the module and check whether the connector pins are deformed or dented).
I/O channel indicators	Green light is always on: there is signal input/output. Off: No signal input/output.
Dimensions (width*height*depth)	32-point module (e.g. EM DE32/QR32/QT32/DR32/DT32): 70×100×81; other modules: 45×100×81;

Analog Modules	EM AE04/08	EM AQ02/04	EM AM03/06	EM AE16/32	EM AQ08	EM AM12/16
Configuration Model	EM AE04/08	EM AQ02/04	EM AM03/06	EM DP01	EM DP01	EM DP01
Number of input channels	4/8 Road	-	2/4 way	16/32 Road	-	8/8 Road
Output channels	-	2/4 way	1/2 way	-	8-way	4/8 Road
Input range	- 10V~10V or 0-20mA			0~10V or 0-20mA		
Input precision	0.3% of full scale					
Output range	- 10V~10V and 0-20mA			0~10V and 0-20mA		
Output resolution	Voltage: 11 bits + sign Current: 11 bits					
Output Impedance	Voltage: ⩾1000Ω Current: ⩽300Ω					
Full scale range	Voltage: -27648 to 27648; Current: 0 to 27648			Voltage/Current: 0 to 27648		
isolation	none					
DIAG indicator	Solid green: The module is configured and has no errors. Flashing green: The module is not configured. Flashing red: Module power supply is abnormal or input channel is out of limit or output The channel is abnormal or the communication with the host is abnormal.			Solid green: The module is configured and has no errors. Flashing green: The module is not configured. Flashing red: The module power supply is abnormal or an analog input channel is out of range or the communication with the host is abnormal (unplug the module and check whether the connector pins are deformed or dented).		
Channel indicator light	Off: The module is not configured. Solid green: The module is configured and has no errors. Flashing red: Module power supply is abnormal; or the input channel is out of range ; Or the output channel is abnormal, because the output has feedback detection, such as The actual output is only 5V when it outputs 10V. For example, the actual output is 0ma when there is no wiring.			Off: The module is not configured. Solid green: The module is configured and has no errors. Flashing green: The input channel is out of range (Note: The output channel does not have feedback detection and cannot detect output channel abnormalities.)		
Dimensions (width*height*depth)	EM AE16/AE32/AQ08/AM12/AM16: 70×100×81; other modules: 45×100×81;					

Temperature acquisition module	EM AR02/04	EM AR08	EM AT04	EM AT08	EM AN16	EM EN88/EN4C
Configuration Model	EM AR02/04	EM AE08	EM AT04	EM AE08	EM DP01	EM DP01

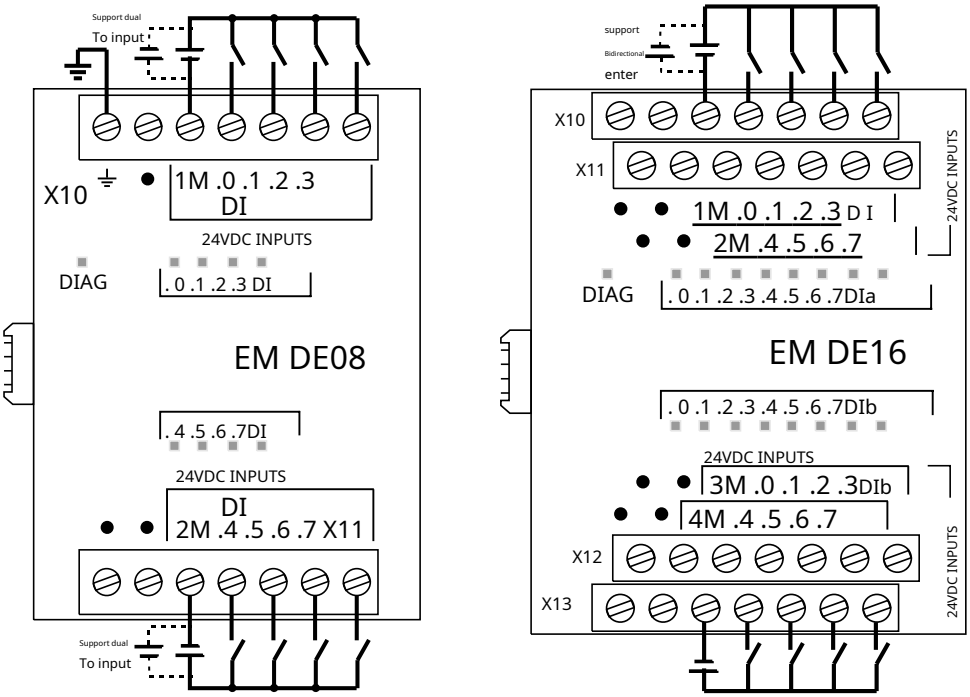
Number of channels	2/4 way	8-way	4-way	8-way	16th Road	8NTC+8AI/12NTC+4AI
Sensor Type	Type: 2/3/4 wire Resistors: All support thermistors Resistance: Only PT100/PT200/PT500/PT1000 (Temperature coefficient Pt 0.003850)	Type: 2/3/4 wire Thermistor: Only PT100 (Temperature coefficient Pt 0.003850) Note: Channel configuration is only Support filtering	J/K/T/E/B/N/C/R&S/TXK/XK(L) type Thermocouple	K type only Thermocouple Note: Channel configuration is only Support filtering	NTC(10K,3950)	
Temperature measurement range	- 200.0℃~850.0℃		Same as the original, see "Note 1" under the table		- 50.0℃～150.0℃	
Corresponding reading range	- 2000~8500(Magnify 10 times)		(Magnify 10 times)		2700~13720 (magnified 10 times)	
Over range reading	Below range minimum: -32768 Out of range maximum value: +32767					
Temperature channel resolution	0.1℃		0.1℃		0.1℃	
Temperature channel accuracy	0.1% of full scale		0.5% of full scale		0.1% of full scale	
Temperature acquisition time	500ms		800ms		800ms	
Sensor wire length	Max. 100 m		Max. 100 m		Max. 30 m	
Analog input range	-		-		-	0~10V or 0-20mA
Analog input accuracy	-		-		-	0.3% of full scale
Register value range	-		-		-	Voltage/Current: 0 to 27648
Isolation	isolation		isolation		none	
DIAG indicator	**Green light is on:**The module is configured and powered without errors. **Green flashing:**The module is not configured. **Flashing Red:**The module power supply is abnormal (the system block needs to check the user power alarm); or the channel is abnormal; or the communication with the host is abnormal (unplug the module and check whether the connector pins are deformed or concave).					
Temperature or analog input Channel indicator light	**Green light is on:**Module configuration, supply The electrical and channel data are normal. **Flashing Red:**Module power supply abnormality Or channel disconnection, over-limit alarm	**Green light is on:**Modules Configuration and power supply are normal. **Flashing Red:**Modules Abnormal power supply or Over-limit alarm	**Green light is on:**Modules Configuration, power supply, communication The data is normal. **Flashing Red:**Modules Power supply abnormality or channel Disconnection and over-limit reporting police	**Green light is on:**Modules Configuration, power supply often. **Flashing Red:**Modules Abnormal power supply or Over-limit alarm	**Green light is on:**Module configuration, power supply, communication The data is normal. **Green flashing:**Module power supply is abnormal; temperature Or the analog input exceeds the range	
Dimensions (width*height*depth)	EM AN16/EN88/EN4C/: 70×100×81; other modules: 45×100×81;					

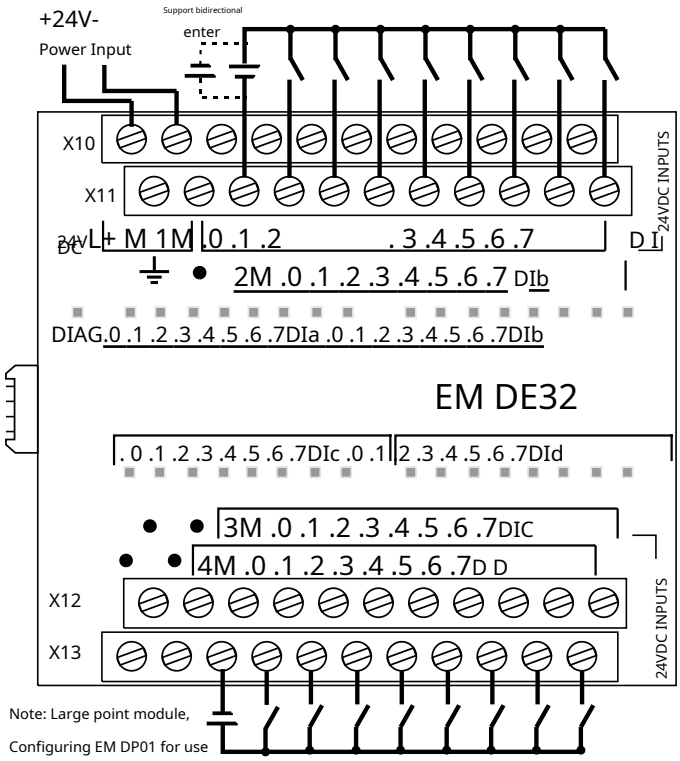
Note 1: EM AT04/8 can support thermocouples and measurement range and accuracy

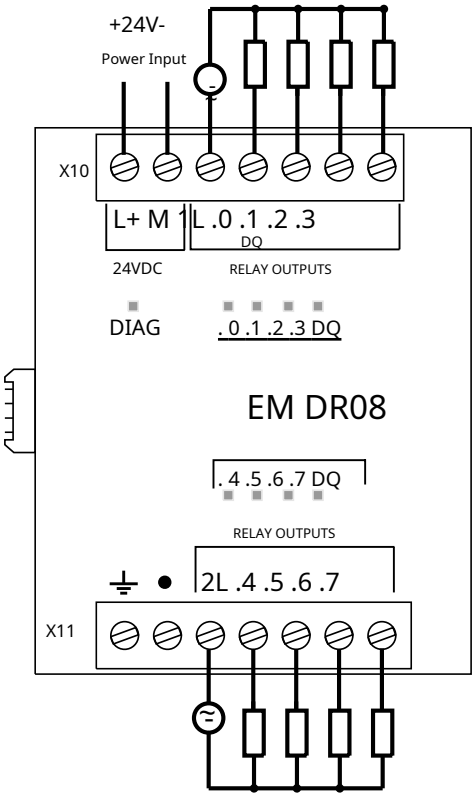
type	Below range minimum	Rated range lower limit	Rated range upper limit	Out of range maximum	Rated at 25°C Range accuracy	- Rated range accuracy from 20°C to 60°C
J	-210.0 °C	- 150.0 °C	1200.0 °C	1450.0 °C	±0.3 °C	±0.6 °C
K	- 270.0 °C	- 200.0 °C	1372.0 °C	1622.0 °C	±0.4 °C	±1.0 °C
T	- 270.0 °C	- 200.0 °C	400.0 °C	540.0 °C	±0.5 °C	±1.0 °C

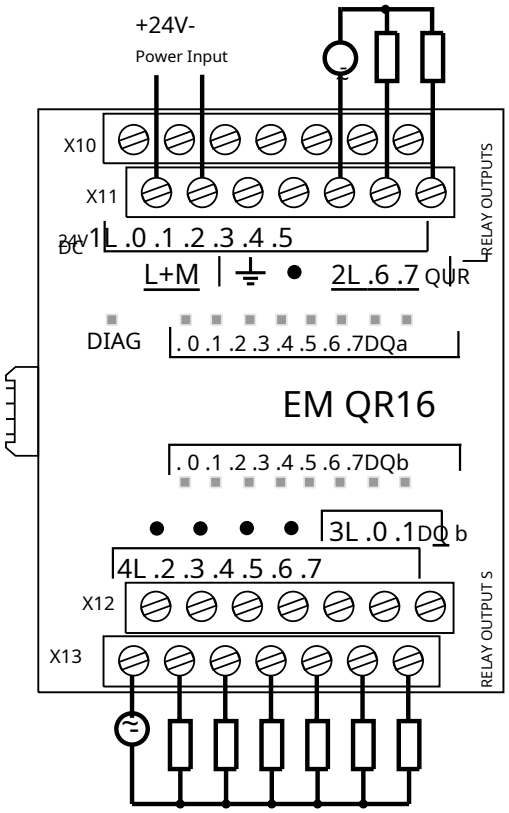
E	- 270.0 °C	- 200.0 °C	1000.0 °C	1200.0 °C	±0.3 °C	±0.6 °C
R & S	-50.0 °C	100.0 °C	1768.0 °C	2019.0 °C	±1.0 °C	±2.5 °C
B	0.0 °C	200.0 °C	800.0 °C	- -	±2.0 °C	±2.5 °C
	- -	800.0 °C	1820.0 °C	1820 °C	±1.0 °C	±2.3 °C
N	- 270.0 °C	- 200.0 °C	1300.0 °C	1550.0 °C	±1.0 °C	±1.6 °C
C	0.0 °C	100.0 °C	2315.0 °C	2500.0 °C	±0.7 °C	±2.7 °C
TXK/XK(L)	- 200.0 °C	- 150.0 °C	800.0 °C	1050 °C	±0.6 °C	±1.2 °C
Voltage	- 32512	-27648 -80mV	27648 80mV	32511	±0.05%	±0.1%

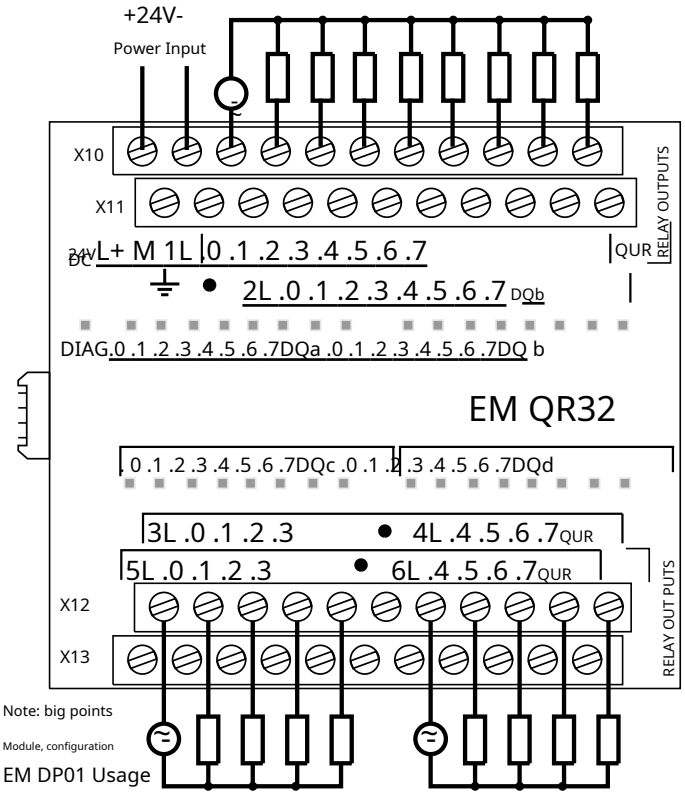
3.4Extension module wiring diagram

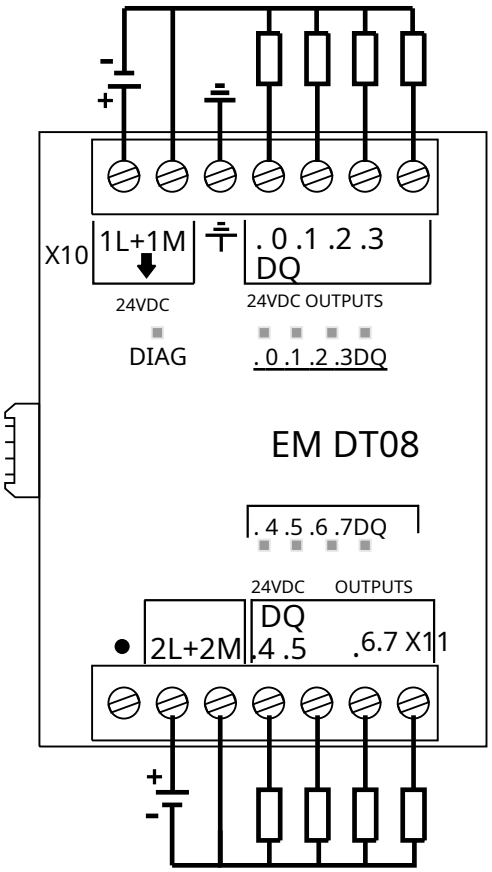


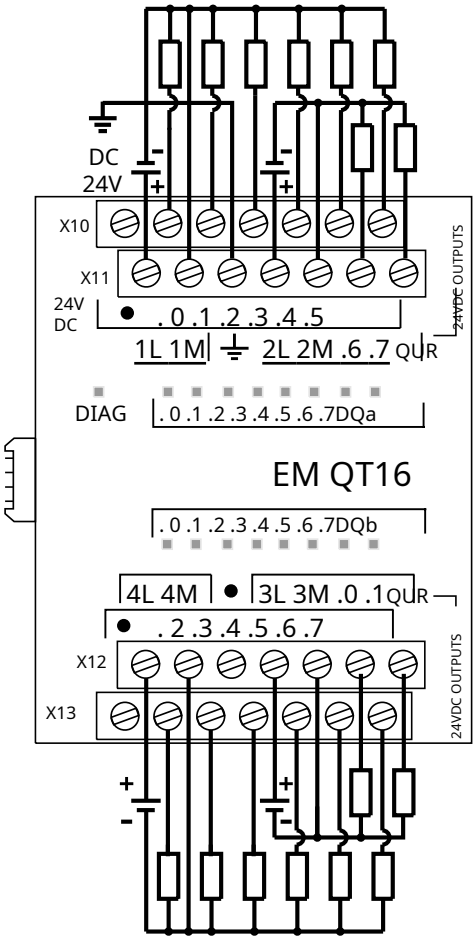

+24V-
Power Input
Support bidirectional
enter
X10
X11
L+ M 1M .0 .1 .2 . 3 .4 .5 .6 .7 D I
2M .0 .1 .2 .3 .4 .5 .6 .7 DIb
DIAG.0 .1 .2 .3 .4 .5 .6 .7DIa .0 .1 .2 .3 .4 .5 .6 .7DIb
EM DE32
. 0 .1 .2 .3 .4 .5 .6 .7DIc .0 .1 2 .3 .4 .5 .6 .7DId
3M .0 .1 .2 .3 .4 .5 .6 .7DIC
4M .0 .1 .2 .3 .4 .5 .6 .7D D
X12
X13
24VDC INPUTS
Note: Large point module,
Configuring EM DP01 for use

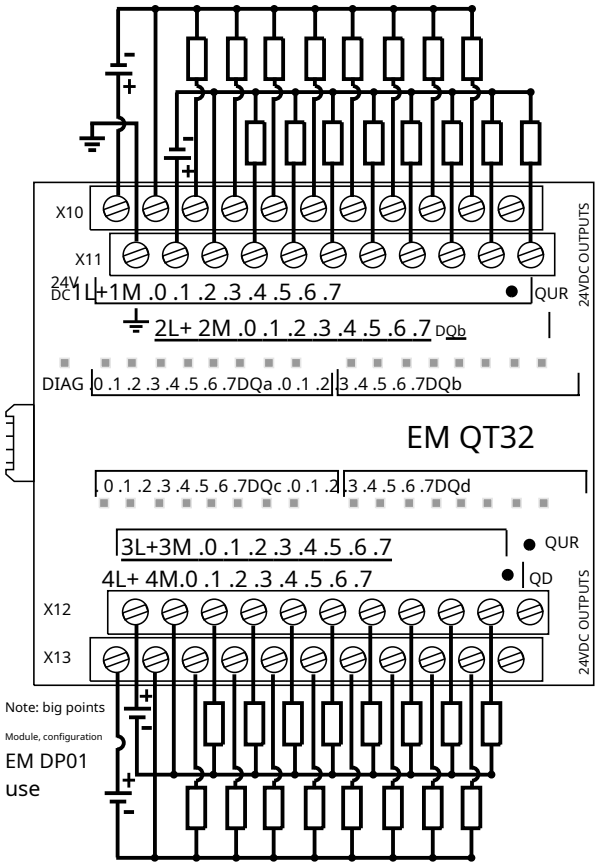

+24V-
Power Input
X10
L+ M 1L .0 .1 .2 .3
DQ
24VDC
RELAY OUTPUTS
DIAG
. 0 .1 .2 .3 DQ
EM DR08
. 4 .5 .6 .7 DQ
RELAY OUTPUTS
2L .4 .5 .6 .7
X11

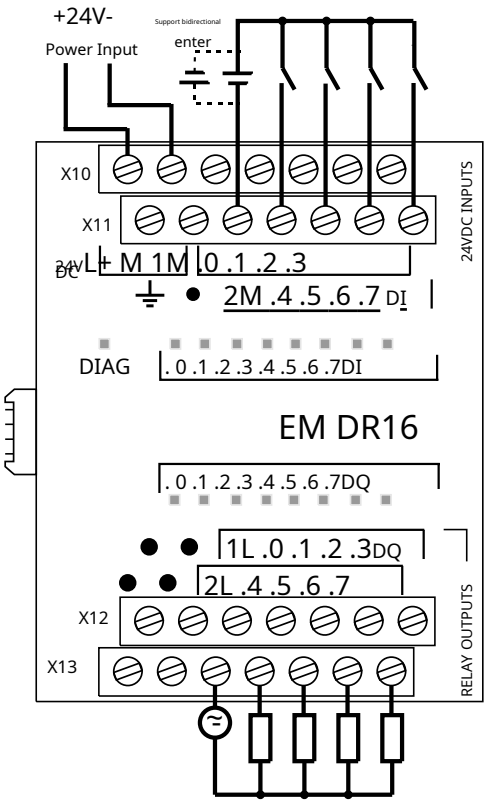

+24V-
Power Input
X10
X11
1L .0 .1 .2 .3 .4 .5
L+M
2L .6 .7 QUR
RELAY OUTPUTS
DIAG
. 0 .1 .2 .3 .4 .5 .6 .7DQa
EM QR16
. 0 .1 .2 .3 .4 .5 .6 .7DQb
3L .0 .1DQ b
4L .2 .3 .4 .5 .6 .7
X12
X13
RELAY OUTPUT S

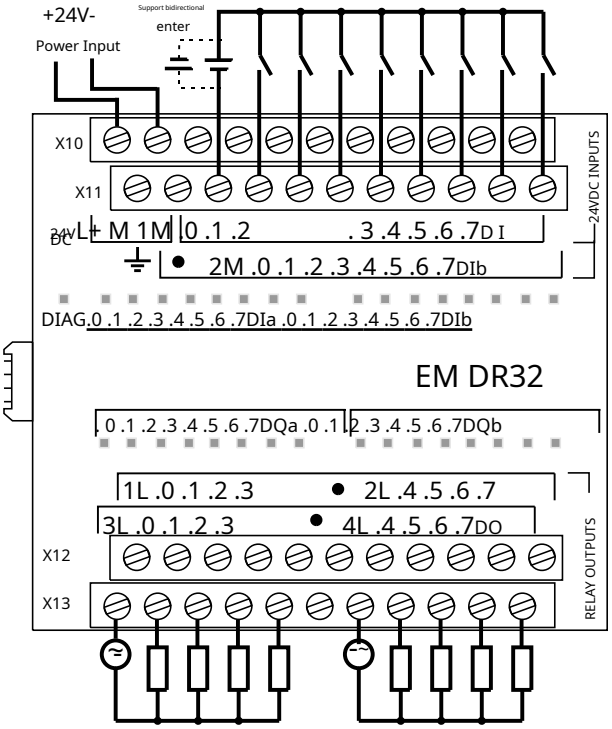

+24V-
Power Input
X10
X11
L+ M 1L .0 .1 .2 .3 .4 .5 .6 .7
QUR
2L .0 .1 .2 .3 .4 .5 .6 .7 DQb
DIAG.0 .1 .2 .3 .4 .5 .6 .7DQa .0 .1 .2 .3 .4 .5 .6 .7DQ b
EM QR32
. 0 .1 .2 .3 .4 .5 .6 .7DQc .0 .1 .2 .3 .4 .5 .6 .7DQd
3L .0 .1 .2 .3
4L .4 .5 .6 .7QUR
5L .0 .1 .2 .3
6L .4 .5 .6 .7QUR
X12
X13
RELAY OUTPUTS
RELAY OUT PUTS
Note: big points
Module, configuration
EM DP01 Usage

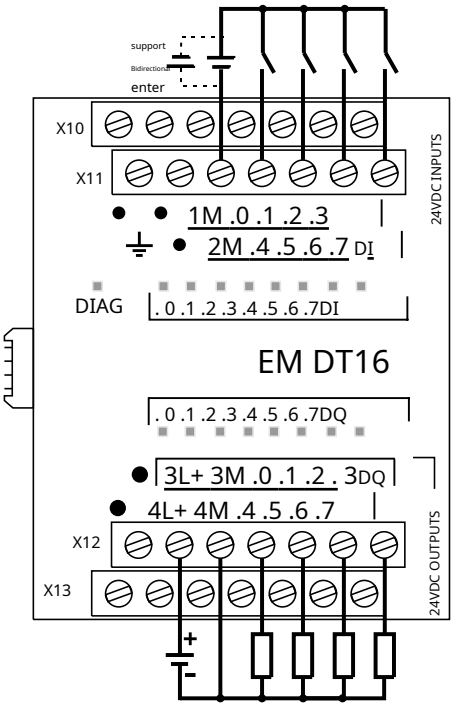

X10
1L+1M
. 0 .1 .2 .3
DQ
24VDC
24VDC OUTPUTS
DIAG
. 0 .1 .2 .3DQ
EM DT08
. 4 .5 .6 .7DQ
24VDC
OUTPUTS
DQ
2L+2M
.4 .5
.6.7 X11

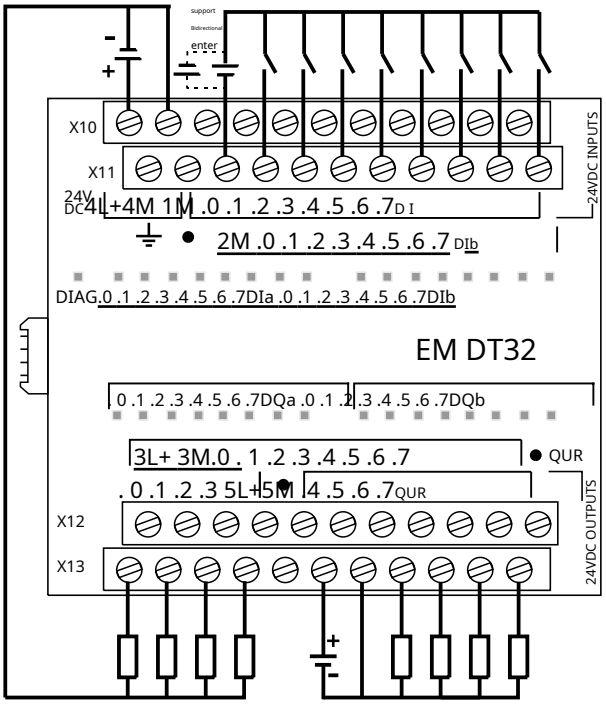

DC
24V
X10
X11
24V
DC
. 0 .1 .2 .3 .4 .5
24VDC OUTPUTS
1L 1M
2L 2M .6 .7 QUR
DIAG
. 0 .1 .2 .3 .4 .5 .6 .7DQa
EM QT16
. 0 .1 .2 .3 .4 .5 .6 .7DQb
4L 4M
3L 3M .0 .1QUR
. 2 .3 .4 .5 .6 .7
X12
X13
24VDC OUTPUTS

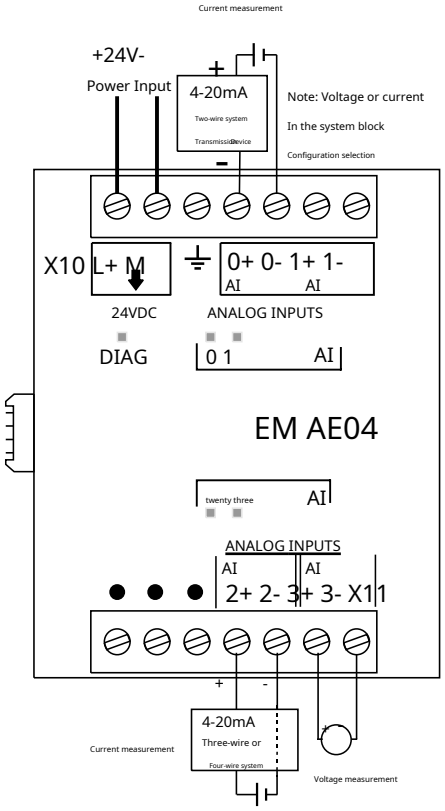

X10
X11
24V DC 1L+ 1M .0 .1 .2 .3 .4 .5 .6 .7
QUR
2L+ 2M .0 .1 .2 .3 .4 .5 .6 .7 DQb
DIAG 0 .1 .2 .3 .4 .5 .6 .7DQa .0 .1 .2 .3 .4 .5 .6 .7DQb
24VDC OUTPUTS
EM QT32
. 0 .1 .2 .3 .4 .5 .6 .7DQc .0 .1 .2 .3 .4 .5 .6 .7DQd
3L+3M .0 .1 .2 .3 .4 .5 .6 .7
QUR
4L+ 4M.0 .1 .2 .3 .4 .5 .6 .7
QD
X12
X13
24VDC OUTPUTS
Note: big points
Module, configuration
EM DP01
use

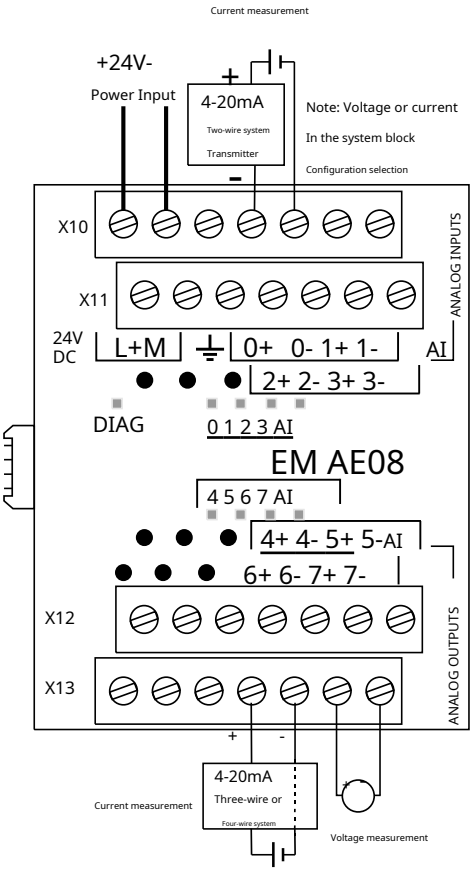

+24V-
Power Input
Support bidirectional
enter
X10
X11
24V DC L+ M 1M .0 .1 .2 .3
2M .4 .5 .6 .7 DI
24VDC INPUTS
DIAG
. 0 .1 .2 .3 .4 .5 .6 .7DI
EM DR16
. 0 .1 .2 .3 .4 .5 .6 .7DQ
1L .0 .1 .2 .3DQ
2L .4 .5 .6 .7
X12
X13
RELAY OUTPUTS

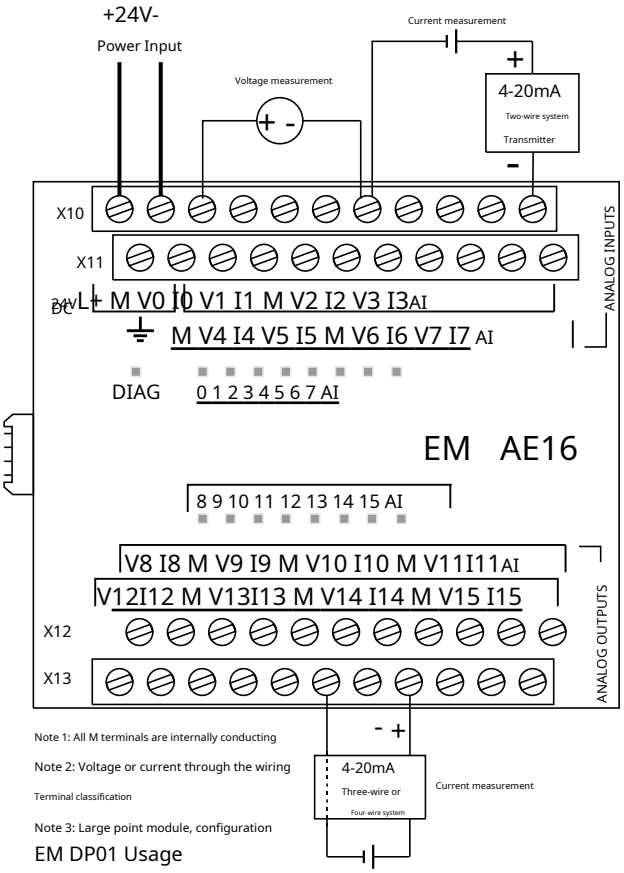

+24V-
Power Input
Support bidirectional
enter
X10
X11
24V DC L+ M 1M 0 .1 .2 . 3 .4 .5 .6 .7D I
2M .0 .1 .2 .3 .4 .5 .6 .7DIb
24VDC INPUTS
DIAG.0 .1 .2 .3 .4 .5 .6 .7DIa .0 .1 .2 .3 .4 .5 .6 .7DIb
EM DR32
. 0 .1 .2 .3 .4 .5 .6 .7DQa .0 .1 .2 .3 .4 .5 .6 .7DQb
1L .0 .1 .2 .3
2L .4 .5 .6 .7
3L .0 .1 .2 .3
4L .4 .5 .6 .7DO
X12
X13
RELAY OUTPUTS

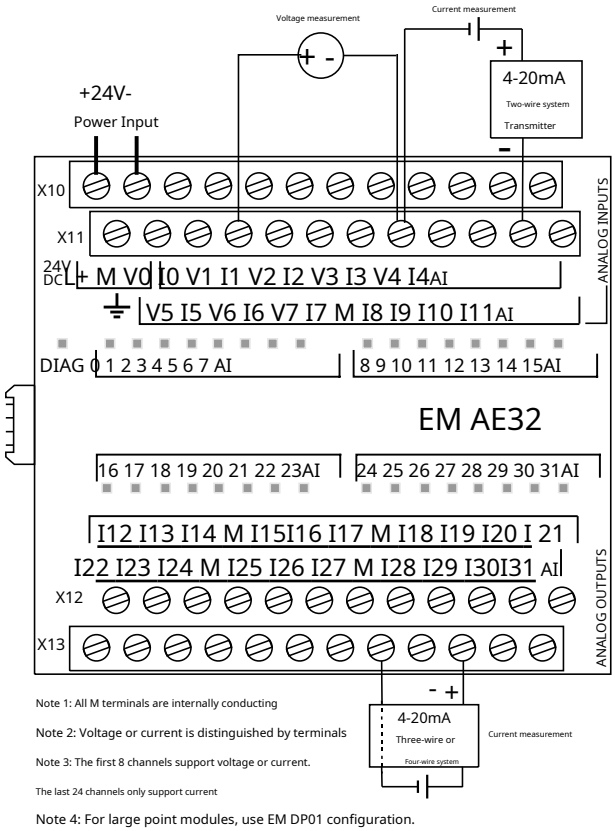

support
Bidirectional
enter
X10
X11
1M .0 .1 .2 .3
2M .4 .5 .6 .7 DI
24VDC INPUTS
DIAG
. 0 .1 .2 .3 .4 .5 .6 .7DI
EM DT16
. 0 .1 .2 .3 .4 .5 .6 .7DQ
3L+ 3M .0 .1 .2 . 3DQ
4L+ 4M .4 .5 .6 .7
X12
X13
24VDC OUTPUTS

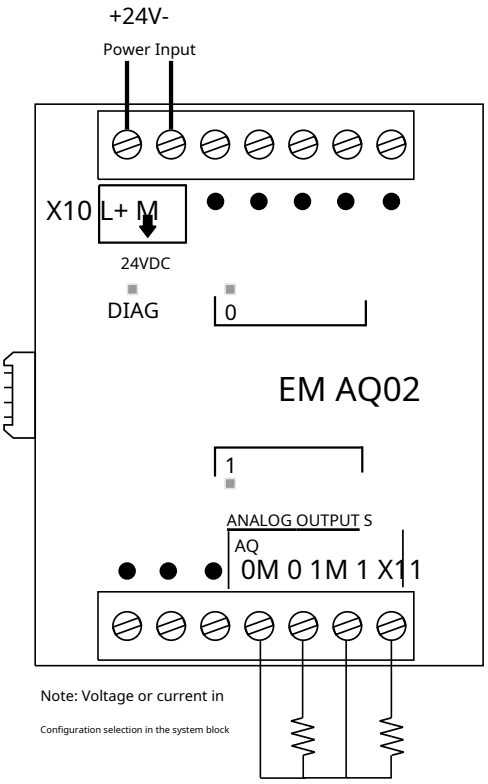

support
Bidirectional
enter
X10
X11
24VDC INPUTS
24V DC
4L+4M 1M .0 .1 .2 .3 .4 .5 .6 .7DI
2M .0 .1 .2 .3 .4 .5 .6 .7 DIb
DIAG.0 .1 .2 .3 .4 .5 .6 .7DIa .0 .1 .2 .3 .4 .5 .6 .7DIb
EM DT32
0 .1 .2 .3 .4 .5 .6 .7DQa .0 .1 .2 .3 .4 .5 .6 .7DQb
3L+ 3M.0 . 1 .2 .3 .4 .5 .6 .7
QUR
. 0 .1 .2 .3 5L+5M .4 .5 .6 .7QUR
24VDC OUTPUTS
X12
X13

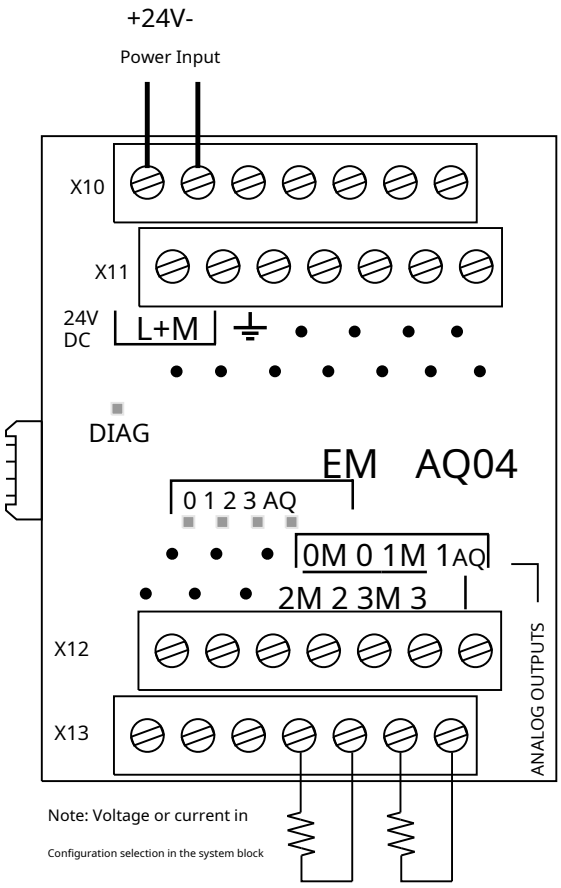

Current measurement
+24V-
Power Input
4-20mA
Two-wire system
Transmission device
Note: Voltage or current
In the system block
Configuration selection
X10 L+ M
0+ 0- 1+ 1-
AI AI
24VDC
ANALOG INPUTS
DIAG
0 1
AI
EM AE04
twenty three
AI
ANALOG INPUTS
AI AI
2+ 2- 3+ 3- X11
4-20mA
Three-wire or
Four-wire system
Current measurement
Voltage measurement

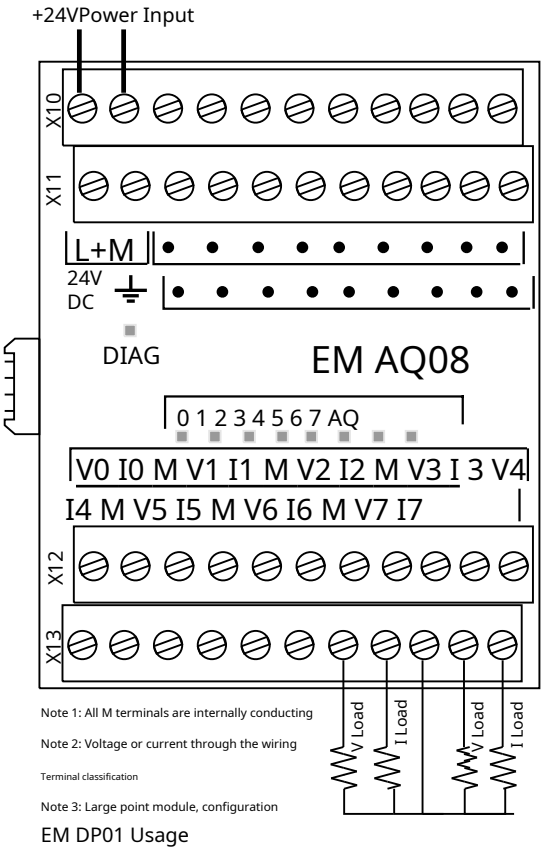

Current measurement
+24V-
Power Input
4-20mA
Two-wire system
Transmitter
Note: Voltage or current
In the system block
Configuration selection
X10
X11
ANALOG INPUTS
24V DC
L+M
0+ 0- 1+ 1-
AI
2+ 2- 3+ 3-
DIAG
0 1 2 3 AI
EM AE08
4 5 6 7 AI
4+ 4- 5+ 5-AI
6+ 6- 7+ 7-
X12
X13
ANALOG OUTPUTS
4-20mA
Three-wire or
Four-wire system
Current measurement
Voltage measurement

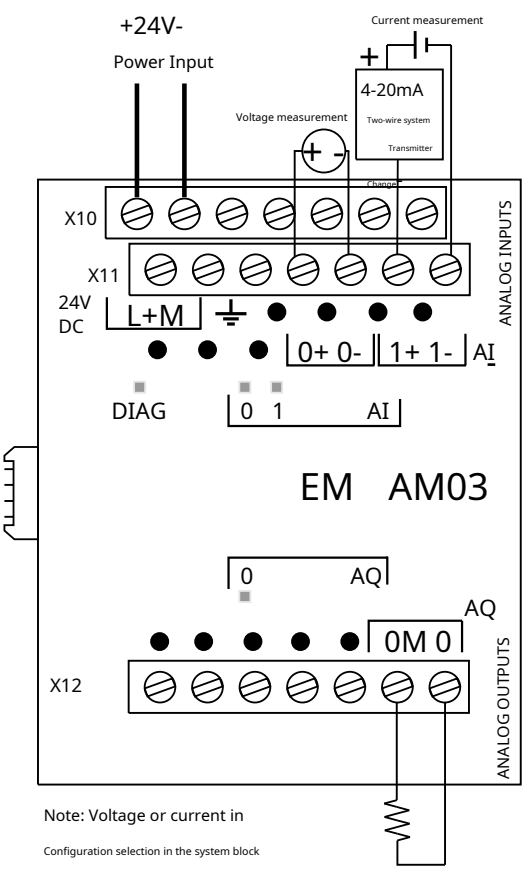

+24V-
Power Input
Current measurement
Voltage measurement
4-20mA
Two-wire system
Transmitter
X10
X11
ANALOG INPUTS
24V DC
L+ M V0 I0 V1 I1 M V2 I2 V3 I3AI
M V4 I4 V5 I5 M V6 I6 V7 I7 AI
DIAG
0 1 2 3 4 5 6 7 AI
EM AE16
8 9 10 11 12 13 14 15 AI
V8 I8 M V9 I9 M V10 I10 M V11I11AI
V12I12 M V13I13 M V14 I14 M V15 I15
X12
X13
ANALOG OUTPUTS
Note 1: All M terminals are internally conducting
Note 2: Voltage or current through the wiring
Terminal classification
Note 3: Large point module, configuration
EM DP01 Usage
4-20mA
Three-wire or
Four-wire system
Current measurement

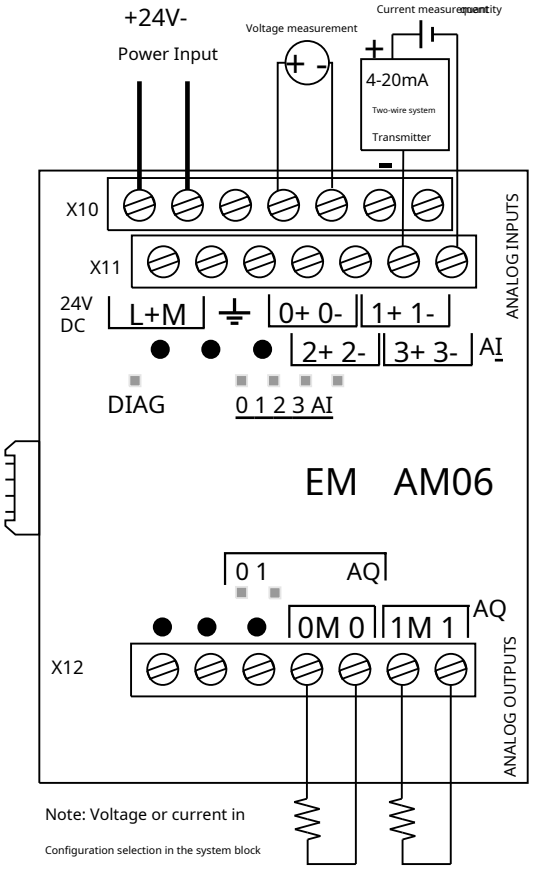

Voltage measurement
Current measurement
+24V-
Power Input
4-20mA
Two-wire system
Transmitter
X10
X11
24V DC
L+ M V0 I0 V1 I1 V2 I2 V3 I3 V4 I4AI
V5 I5 V6 I6 V7 I7 M I8 I9 I10 I11AI
ANALOG INPUTS
DIAG 0 1 2 3 4 5 6 7 AI
8 9 10 11 12 13 14 15AI
EM AE32
16 17 18 19 20 21 22 23AI
24 25 26 27 28 29 30 31AI
I12 I13 I14 M I15I16 I17 M I18 I19 I20 I 21
I22 I23 I24 M I25 I26 I27 M I28 I29 I30I31 AI
X12
X13
ANALOG OUTPUTS
4-20mA
Three-wire or
Four-wire system
Current measurement
Note 1: All M terminals are internally conducting
Note 2: Voltage or current is distinguished by terminals
Note 3: The first 8 channels support voltage or current.
The last 24 channels only support current
Note 4: For large point modules, use EM DP01 configuration.

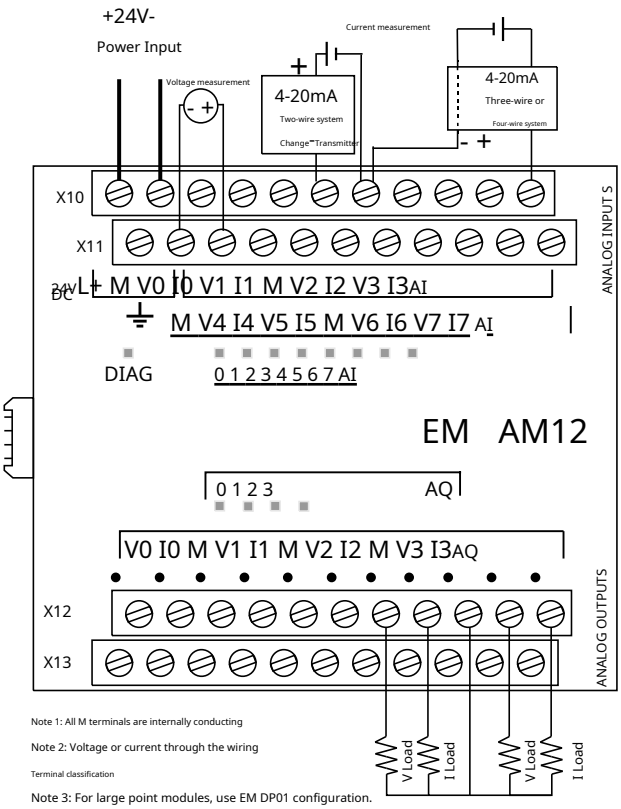

+24V-
Power Input
X10 L+ M
24VDC
DIAG
0
EM AQ02
1
ANALOG OUTPUT S
AQ
0M 0 1M 1 X11
Note: Voltage or current in
Configuration selection in the system block

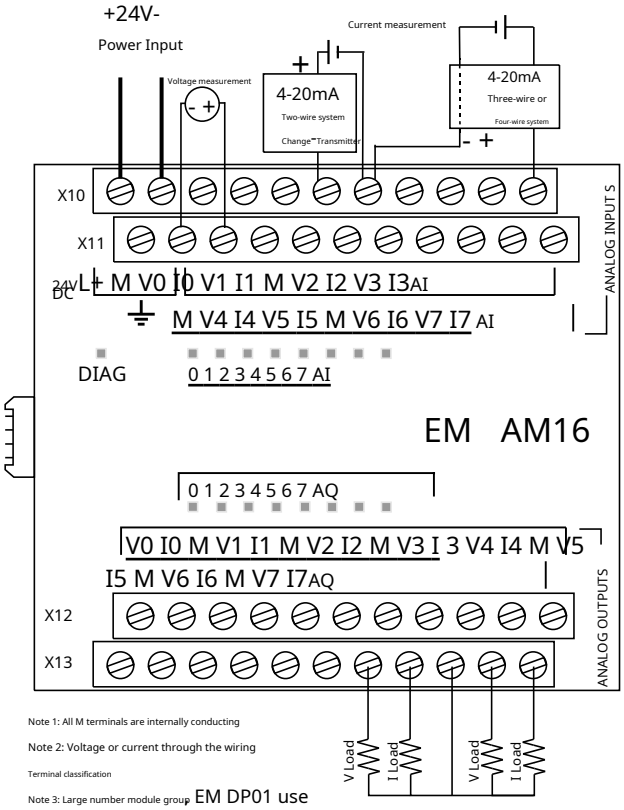

+24V-
Power Input
X10
X11
24V DC
L+M
DIAG
EM AQ04
0 1 2 3 AQ
0M 0 1M 1AQ
2M 2 3M 3
X12
X13
ANALOG OUTPUTS
Note: Voltage or current in
Configuration selection in the system block

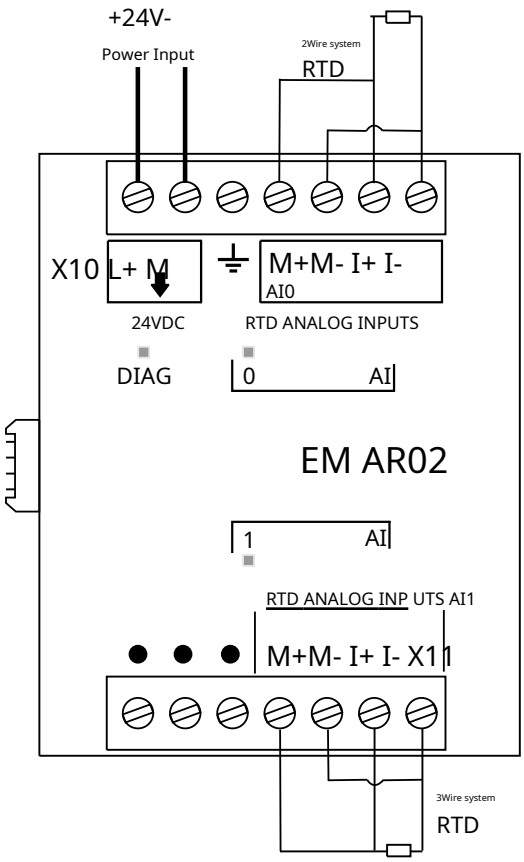

+24VPower Input
X10
X11
L+M
24V DC
DIAG
EM AQ08
0 1 2 3 4 5 6 7 AQ
V0 I0 M V1 I1 M V2 I2 M V3 I 3 V4
I4 M V5 I5 M V6 I6 M V7 I7
X12
X13
V Load
I Load
V Load
I Load
Note 1: All M terminals are internally conducting
Note 2: Voltage or current through the wiring
Terminal classification
Note 3: Large point module, configuration
EM DP01 Usage

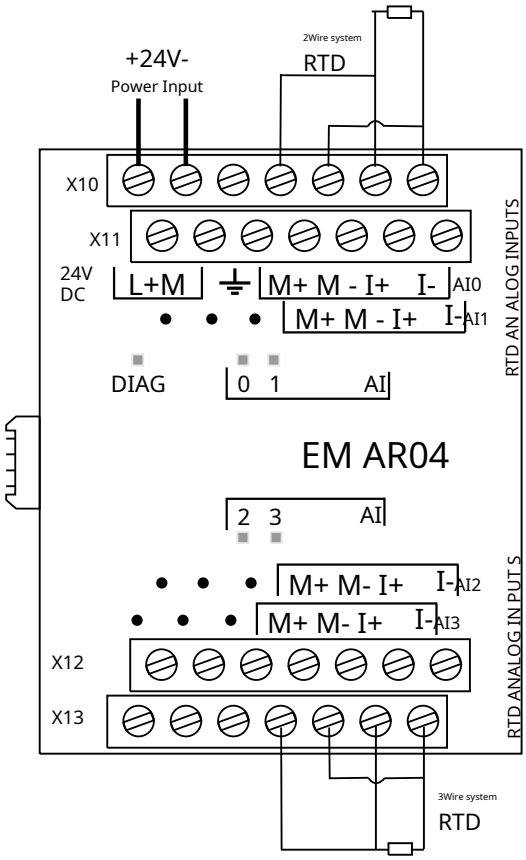

+24V-
Power Input
Current measurement
4-20mA
Two-wire system
Transmitter
Voltage measurement
X10
X11
24V DC
L+M
0+ 0-
1+ 1-
AI
DIAG
0 1
AI
ANALOG INPUTS
EM AM03
0
AQ
AQ
0M 0
X12
ANALOG OUTPUTS
Note: Voltage or current in
Configuration selection in the system block

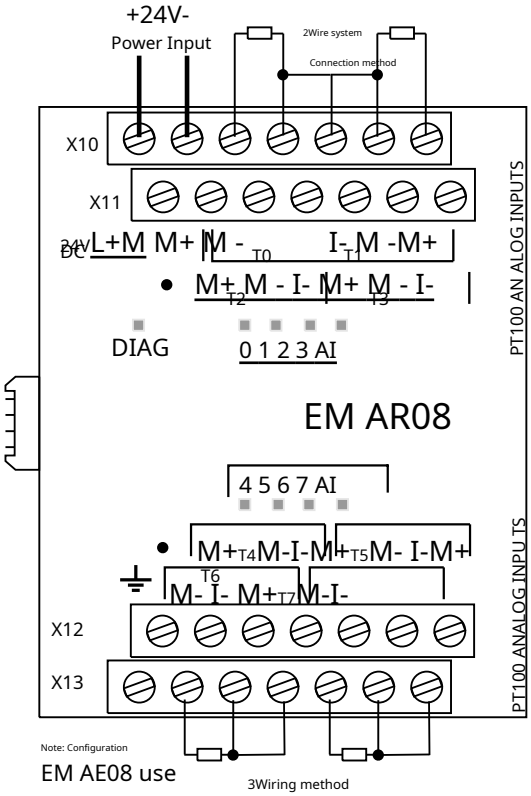

+24V-
Power Input
Voltage measurement
Current measurement
4-20mA
Two-wire system
Transmitter
X10
X11
24V DC
L+M
0+ 0-
1+ 1-
2+ 2-
3+ 3-
AI
DIAG
0 1 2 3 AI
ANALOG INPUTS
EM AM06
0 1
AQ
AQ
0M 0
1M 1
X12
ANALOG OUTPUTS
Note: Voltage or current in
Configuration selection in the system block

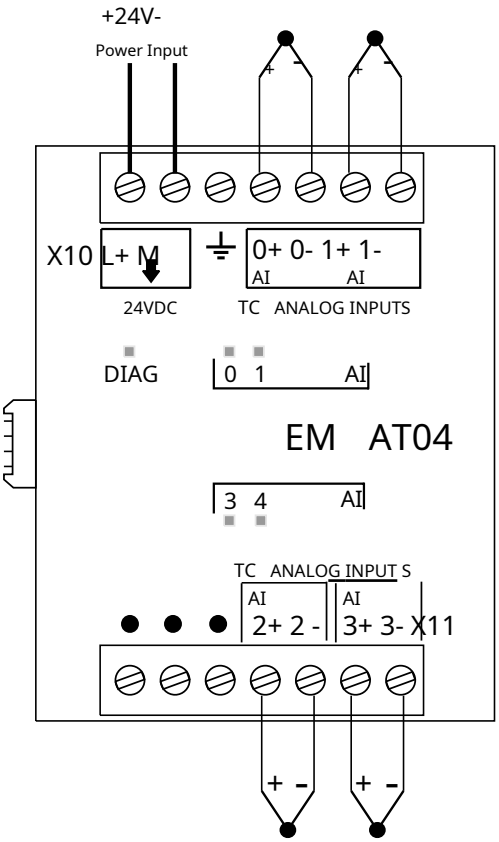

+24V-
Power Input
Current measurement
Voltage measurement
4-20mA
Two-wire system
Change Transmitter
4-20mA
Three-wire or
Four-wire system
X10
X11
24V DC
L+ M V0 I0 V1 I1 M V2 I2 V3 I3AI
M V4 I4 V5 I5 M V6 I6 V7 I7 AI
DIAG
0 1 2 3 4 5 6 7 AI
ANALOG INPUTS
EM AM12
0 1 2 3
AQ
V0 I0 M V1 I1 M V2 I2 M V3 I3AQ
X12
X13
ANALOG OUTPUTS
V Load
I Load
Note 1: All M terminals are internally conducting
Note 2: Voltage or current through the wiring
Terminal classification
Note 3: For large point modules, use EM DP01 configuration.

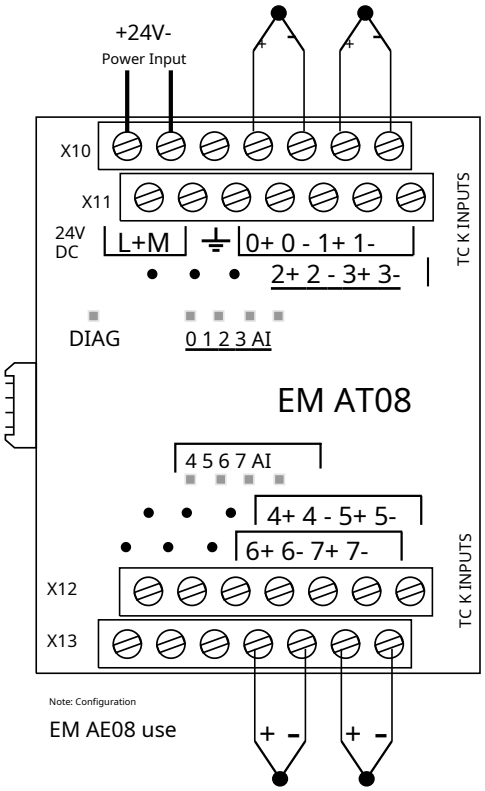

+24V-
Power Input
Current measurement
Voltage measurement
4-20mA
Two-wire system
Change Transmitter
4-20mA
Three-wire or
Four-wire system
X10
X11
24V DC
L+ M V0 I0 V1 I1 M V2 I2 V3 I3AI
M V4 I4 V5 I5 M V6 I6 V7 I7 AI
DIAG
0 1 2 3 4 5 6 7 AI
ANALOG INPUTS
EM AM16
0 1 2 3 4 5 6 7 AQ
V0 I0 M V1 I1 M V2 I2 M V3 I 3 V4 I4 M V5
I5 M V6 I6 M V7 I7AQ
X12
X13
ANALOG OUTPUTS
V Load
I Load
Note 1: All M terminals are internally conducting
Note 2: Voltage or current through the wiring
Terminal classification
Note 3: Large number module group EM DP01 use

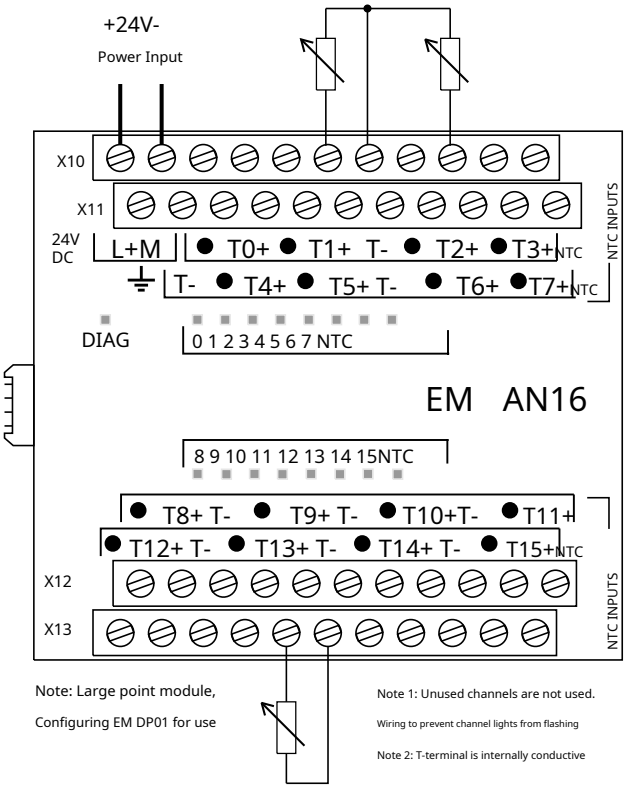

+24V-
Power Input
2Wire system
RTD
X10 L+ M
M+M- I+ I-
AI0
24VDC
RTD ANALOG INPUTS
DIAG
0 AI
EM AR02
1 AI
RTD ANALOG INP UTS AI1
M+M- I+ I- X11
3Wire system
RTD

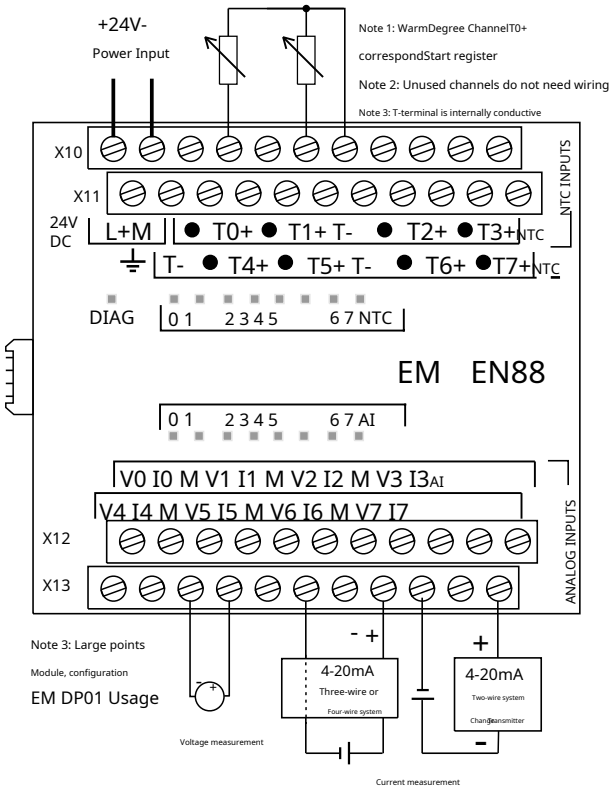

+24V-
Power Input
2Wire system
RTD
X10
X11
24V DC
L+M
M+ M - I+ I- AI0
M+ M - I+ I- AI1
DIAG
0 1 AI
RTD AN ALOG INPUTS
EM AR04
2 3 AI
M+ M- I+ I- AI2
M+ M- I+ I- AI3
X12
X13
RTD ANALOG IN PUT S
3Wire system
RTD

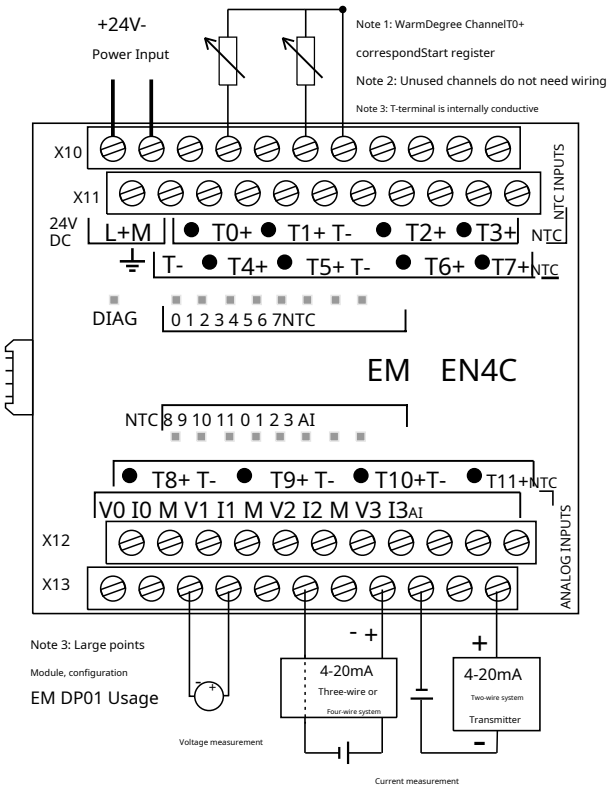

+24V-
Power Input
2Wire system
Connection method
X10
X11
24V DC
L+M M+ M - I- M -M+
M+ M - I- M+ M - I-
DIAG
0 1 2 3 AI
EM AR08
4 5 6 7 AI
M+ M-I-M+ M- I-M+
M- I- M+ M-I-
X12
X13
PT100 AN ALOG INPUTS
PT100 ANALOG INPU TS
Note: Configuration
EM AE08 use
3Wiring method


+24V-
Power Input
X10 L+ M
0+ 0- 1+ 1-
AI AI
24VDC
TC ANALOG INPUTS
DIAG
0 1 AI
EM AT04
3 4 AI
TC ANALOG INPUT S
AI AI
2+ 2 - 3+ 3- X11


+24V-
Power Input
X10
X11
24V DC
L+M
0+ 0 - 1+ 1-
2+ 2 - 3+ 3-
TC K INPUTS
DIAG
0 1 2 3 AI
EM AT08
4 5 6 7 AI
4+ 4 - 5+ 5-
6+ 6- 7+ 7-
X12
X13
TC K INPUTS
Note: Configuration
EM AE08 use


+24V-
Power Input
X10
X11
24V DC
L+M
T0+ T1+ T- T2+ T3+NTC
T- T4+ T5+ T- T6+ T7+NTC
NTC INPUTS
DIAG
0 1 2 3 4 5 6 7 NTC
EM AN16
8 9 10 11 12 13 14 15NTC
T8+ T- T9+ T- T10+T- T11+
T12+ T- T13+ T- T14+ T- T15+NTC
X12
X13
NTC INPUTS
Note: Large point module,
Configuring EM DP01 for use
Note 1: Unused channels are not used.
Wiring to prevent channel lights from flashing
Note 2: T-terminal is internally conductive


+24V-
Power Input
Note 1: WarmDegree ChannelT0+
correspondStart register
Note 2: Unused channels do not need wiring
Note 3: T-terminal is internally conductive
X10
X11
24V DC
L+M
T0+ T1+ T- T2+ T3+NTC
T- T4+ T5+ T- T6+ T7+NTC
NTC INPUTS
DIAG
0 1 2 3 4 5 6 7 NTC
EM EN88
0 1 2 3 4 5 6 7 AI
V0 I0 M V1 I1 M V2 I2 M V3 I3AI
V4 I4 M V5 I5 M V6 I6 M V7 I7
X12
X13
ANALOG INPUTS
Note 3: Large points
Module, configuration
EM DP01 Usage
4-20mA
Three-wire or
Four-wire system
4-20mA
Two-wire system
Transmitter
Voltage measurement
Current measurement


+24V-
Power Input
Note 1: WarmDegree ChannelT0+
correspondStart register
Note 2: Unused channels do not need wiring
Note 3: T-terminal is internally conductive
X10
X11
24V DC
L+M
T0+ T1+ T- T2+ T3+
NTC
T- T4+ T5+ T- T6+ T7+NTC
NTC INPUTS
DIAG
0 1 2 3 4 5 6 7NTC
EM EN4C
NTC 8 9 10 11 0 1 2 3 AI
T8+ T- T9+ T- T10+T- T11+NTC
V0 I0 M V1 I1 M V2 I2 M V3 I3AI
X12
X13
ANALOG INPUTS
Note 3: Large points
Module, configuration
EM DP01 Usage
4-20mA
Three-wire or
Four-wire system
4-20mA
Two-wire system
Transmitter
Voltage measurement
Current measurement

3.5Frequently asked questions

3.5.1 How to determine whether the purchased Gongbei module can be directly plugged into the expansion module of the original host? A: There is an indicator light on the front of the expansion module with the word "DIAG" printed on it.

3.5.2 Can the Gongbei Smart expansion module be directly connected to the original Smart host or original Smart expansion module?

Answer: Yes.

3.5.3 What does the on/off status of the analog module channel indicator light represent? What about the temperature module? A: Each model is different, please refer to the "3. Technical Parameters" section of this document.

3.5.4 Is the value read by the temperature expansion module channel the temperature value?

A: Yes, it is a temperature value amplified 10 times, and no conversion is required. For example, if the reading is 123, it means 12.3 degrees Celsius.

3.5.4 The V memory address of the Gongbei high-point module in the information table shows 0, and the status is "DP communication is not started after power on" Answer: EM DP01 must be configured in the system block of the large point module and the system block must be downloaded to display normally in the information table.

3.5.5 Description of special registers of expansion modules

①: Diagnostic alarm code: To know which device is alarming, check "Diagnostic alarm device ID"

16#FFFF // default state after power-on;

16#0000 //Normal operation or normal communication but not configured

16#4023 //Configuration parameters do not match the device type;

16#4011 //The analog device lacks user power;

16#0007 //AI channel x upper limit alarm;

16#0008 //AI channel x lower limit alarm;

16#8x07 //AO channel x upper limit alarm;

16#8x08 //AO channel x lower limit alarm;

16#8x01 //AO channel x short circuit alarm;

16#8x06 //AO channel x open circuit alarm;

② : Diagnostic alarm device ID: The device ID of the diagnostic alarm, ranging from 1 to 16. If multiple devices have diagnostic alarms, only the device ID with the smallest ID value is displayed.

③： Device ID of disconnection error: The device ID of the device with abnormal communication, ranging from 1 to 16. If multiple devices have communication disconnection, only the device ID with the smallest ID value is displayed.

④: Data type string, which can be monitored and viewed in the status table in "ASCII" format.

4. Signal board usage

Gongbei Smart series signal board realizes plug-and-play through original bus technology, without installing any library. No programming is required, it is directly mapped to the internal register, and the host can read and write directly. The usage is almost the same as Xizi signal board.

Perfect compatibility. Adapt to Xizi host (including V3 version). More resource points, richer variety, lower price and stable performance.

4.1 Installing and removing the signal board

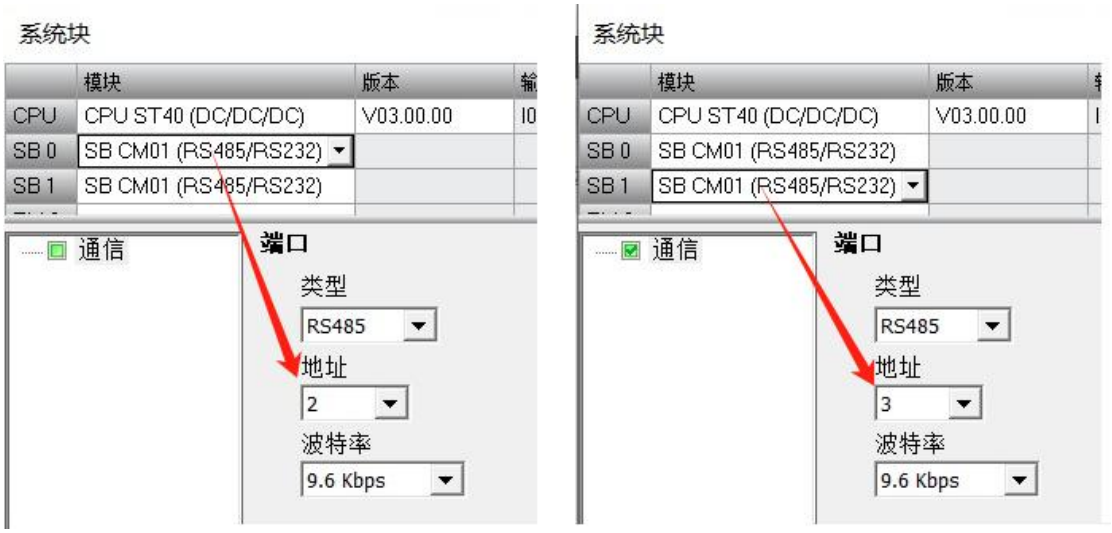
Note: Smart host does not support hot swap.**Absolutely prohibited**For installation and removal of the signal board under power, refer to Section 3.3.3 of the smart system manual. The excerpt is as follows:

表格 3- 3　在 CPU 中安装信号板

任务	步骤
	请按以下步骤安装信号板或电池板 1. 确保 CPU 和所有 S7-200 SMART 设备与电源断开连接。 2. 卸下 CPU 上部和下部的端子块盖板。 3. 将螺丝刀插入 CPU 上部接线盒盖背面的槽中。 4. 轻轻将盖撬起并从 CPU 上卸下。 5. 将信号板或电池板直接向下放入 CPU 上部的安装位置中。 6. 用力将模块压入该位置直到卡入就位。

4.2 Signal board configuration selection

- For SB CM01 and SB CM02 signal boards, just select SB CM01 for configuration. Just note that SB CM02 can only be used for 485 communication.
- For SB DE02, SB QT02, and SB DT04 signal boards, just select SB DT04 for configuration, and the address will be shown in the configuration table.
- For all other models, configure it as SB CM01 in the system block, as shown below.



illustrate 1: Installed in SB0 The slot address to be set is 2, installed in SB1 The slot address to be set is 3.two Type can only be selected RS485, the baud rate can only be selected 9.6Kbps .

illustrate 2: The picture above is V3.0 software, There are two signal board slots, For lower version programming software , only SB0 groove If you want to set the position, please follow the settings as shown on the left.

Download the system block into the plc and run it. The LINK indicator light on the upper left corner of the signal board lights up, indicating that the setting is successful.

4.3The register mapping relationship is as follows

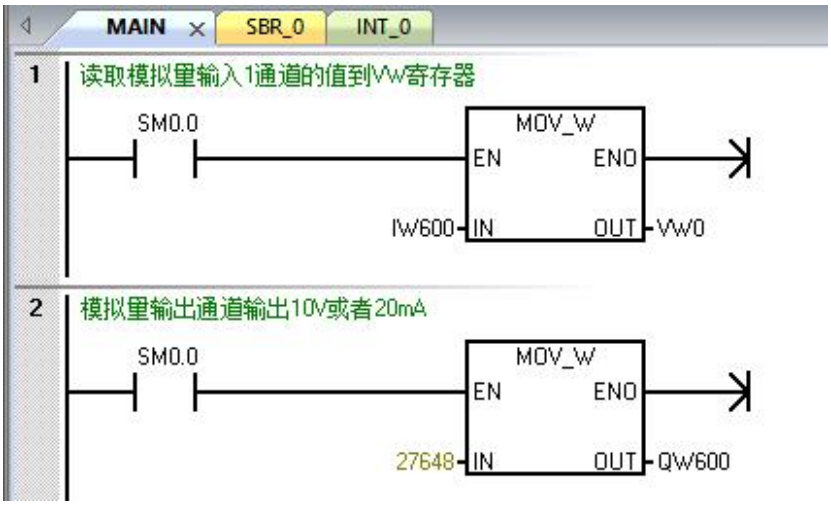
- After configuration and downloading, the resources will be automatically mapped into the host and can be used directly.
- SB DE02,SB QT02,SB DT04 resource address is checked in the configuration table. This chapter does not apply to these three types. For other
- models, install the signal board in the SB0 slot, select 2 for the configuration address, input the resource start address I600, and output the resource start address Q600. Install the signal board in the SB1 slot, select 3 for the configuration address, input the resource start address I616, and output the resource start address Q616. Details are as follows
- Signal boards of version V30 or above support Smart V3 host. The version number is on the front of the signal board housing, for example, GB-H4AJU703-V31, and the last 3 digits represent the version number. As shown below

Analog or temperature channel		describe	Example
SB0 slot, Configuration address 2	SB1 slot, Configuration address 3		
IW600	IW616	Input channel 0 acquisition value	For example, if the SB AM06 signal board is installed in the SB0 slot and the configuration address is set to 2, the analog acquisition values are stored in IW600, IW602, IW604, and IW606 in sequence. If the acquisition value is 27648, it means that 10V or 20mA is input. Assign 27648 to QW600, and analog output channel 1 can output 10V or 20mA. Assign 13824 to QW602, and analog output channel 2 can output 5V or 10mA. For example, the SB AR02 signal board is installed in the SB1 slot, the configuration address is set to 3, and the temperature acquisition values are stored in IW616 and IW618 in sequence. For example, the acquisition value is 123, which means the current temperature is 12.3 degrees, and the acquisition value is magnified 10 times.
IW602	IW618	Input channel 1 acquisition value	
IW604	IW620	Input channel 2 acquisition value	
IW606	IW622	Input channel 3 acquisition value	
IW608	IW624	Input channel 4 acquisition value	
IW610	IW626	Input channel 5 acquisition value	
QW600	QW616	Output channel 0 setting value	
QW602	QW618	Output channel 1 setting value	
QW604	QW620	Output channel 2 set value	
QW606	QW622	Output channel 3 set value	
Digital channel address		describe	Example
SB0 slot, Configuration address 2	SB1 slot, Configuration address 3		
I600.0	I616.0	Input channel 0	For example, SB DE04 is installed in slot SB0, and the configuration address is set to 2. The digital input signals are mapped to I600.0, I600.1, I600.2, and I600.3 in sequence. If the value is 1, it means there is a digital input signal. For example, SB QT04 is installed in slot SB1, the configuration address is set to 3, the output signal is mapped in Q616.0, Q616.1, Q616.2, Q616.3, Q616.2 is assigned a value of 1, and the digital output 3 channel will output 24V. Special attention：SB DE02, SB QT02, SB DT04 Configuration Select SB DT04 and view the mapping address in the configuration table.
I600.1	I616.1	Input Channel 1	
I600.2	I616.2	Input Channel 2	
I600.3	I616.3	Input Channel 3	
I600.4	I616.4	Input Channel 4	
I600.5	I616.5	Input Channel 5	
Q600.0	Q616.0	Output channel 0	
Q600.1	Q616.1	Output channel 1	
Q600.2	Q616.2	Output Channel 2	
Q600.3	Q616.3	Output channel 3	
Q600.4	Q616.4	Output Channel 4	
Q600.5	Q616.5	Output Channel5	
Special registers		describe	

IB612 or I612.0 (corresponding to SB0 slot, signal board with configuration address 2)	Heartbeat register, 0 or 1, changes every 0.5 seconds, used to determine the communication status. Note: Only the version number is V30Not supportedHeartbeat register function. All other versions are supported. The version number is on the front of the signal board housing, for example, GB-H4AJU703V31, and the last 3 digits represent the version number. For signal boards without version numbers, the heartbeat register is IB620.
IB628 or I628.0 (corresponding to SB1 slot, signal board with configuration address 3)	
QW610 (corresponding to SB0 slot, configuration Signal board at address 2)	Analog input filter function (setting range 0-4, 4 levels in total) 1: Sampling period about 20mS, lightest filter. 2 or 0 (default value): about 100ms. 3: about 150ms filter. 4: about 200ms filter. Note: The analog input filter function is not saved when power is off, and the host needs to assign values all the time
QW624 (corresponding to SB1 slot, configuration Signal board at address 3)	

Tip: The starting address of the mapping register is printed on the back of the circuit board for quick viewing.

Next, you can directly read and write the mapped registers. Take SB AM06 as an example. Install it in slot SB0 and configure address 2. The read and write resources are as shown below.



Network 1 means reading the value of the first analog input channel into VW0;

Network 2 indicates that the first analog output channel outputs 20ma or 10V. (27648 corresponds to the full scale of 10V and 20ma)

4.4Signal board technical parameters

Communication signal board technical parameters	SB CM01	SB CM02
RS485 Function	Cable length: 1000 meters; Isolation: None	Cable length: 1000 meters; Isolation: None
RS232 Function	Cable length: 10 meters; Isolation: None	—

Digital signal board	SB DE02	SB DE04	SB DE06	SB DT04	SB QT02	SB QT04	SB QT06
Number of channels	2 in	4 in	6 in	2 in 2 out	2 out	4 out	6 out
Digital input type	Sink type or source type (supports bidirectional input, common terminal can be positive or negative)						
Digital input voltage	Logic 1 minimum voltage: 15VDC at 2.5mA						
	Logic 0 maximum voltage: 5VDC at 1ma						

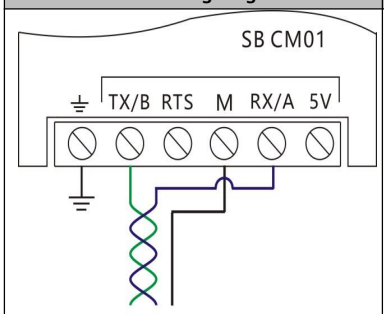
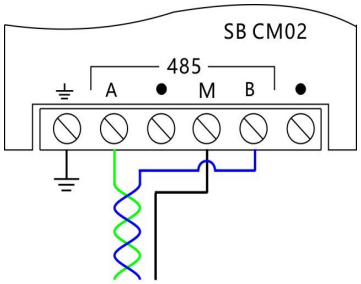
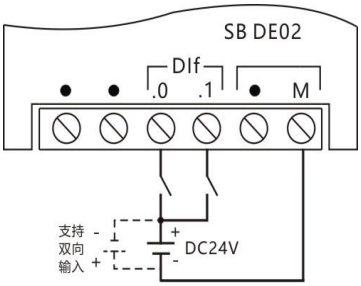
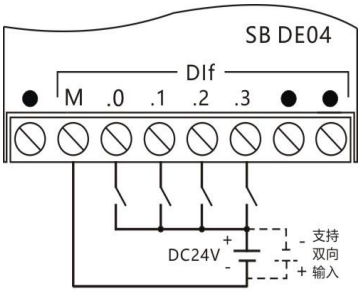
Digital input isolation	Internal optocoupler isolation
Digital output type	Source Type
Maximum output current	0.5A
Digital output isolation	Internal optocoupler isolation
L+,M Rated voltage	24VDC (30VDC max)

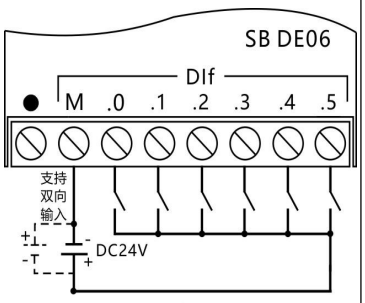
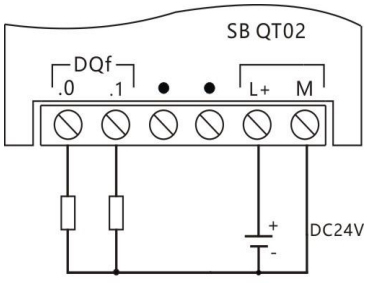
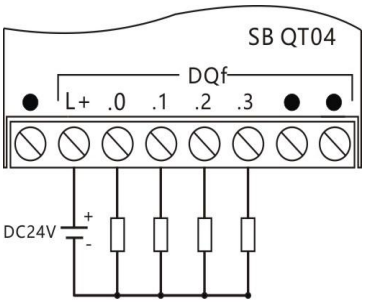
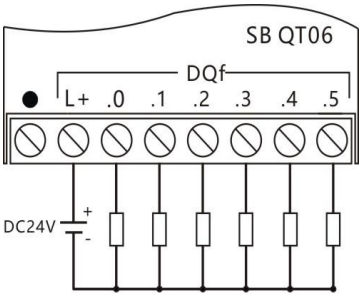
Analog Input Specifications	SB AE02	SB AM03	SB AM04	SB AE04	SB AM05	SB AM06	SB AE06
Number of input channels	2 voltage or current			4 voltage or current			6 voltage or current channels
Measuring range	0-10V, 0-20mA						
Full scale range	0-27648						
Accuracy	0.3% of full scale						
isolation	none						

Analog output specifications	SB AM03	SB AM05	SB AM04	SB AM06	SB AQ02	SB AQ04
Output channels	1 voltage or current		2-way current	2 voltage or current		4-way current
Resolution	Voltage: 11 bits + sign Current: 11 bits					
Full-scale range (data word)	0 to 27,648 for 0-10V and 0-20mA					
Accuracy	0.3% of full scale					
Load impedance	Voltage: ⩾1000Ω Current: ⩽600Ω					
isolation	none					
Maximum cable length	10m shielded twisted pair cable					

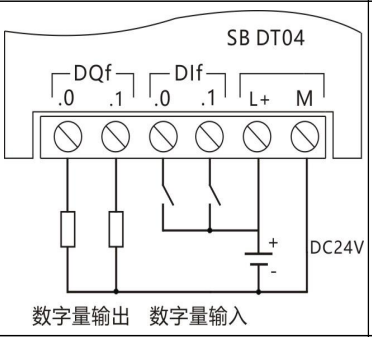
Temperature signal board	SB AR02	SB AR04	SB AN04	SB AN06	SB AT04
Number of channels	2-way	4-way	4-way	4 channels + 2 channels AI	4-way
Sensor Type	2, 3, 4-wire PT100	2-wire PT100 only	NTC(10K,3950)		K-type thermocouple
Temperature measurement range	- 200.0℃~600.0℃		-50.0℃~150.0℃		- 270.0℃~1372.0℃
Reading range	- 2000~6000 (magnification 10 times)		- 500~1500 (magnification 10 times)		- 2700~13720 (magnified 10 times)
Open circuit and short circuit detection	±32000		±32000		±32000
Resolution	0.1℃		0.1℃		0.1℃
Accuracy	0.1% of full scale		0.5% of full scale		0.1% of full scale
Collection time	300ms	800ms	200ms		800ms
Wire length	Max. 100 m		Max. 30 m		Max. 20 m
Isolation	isolation	isolation	none	none	isolation

4.5Signal board wiring diagram and dial switch

SB CM01Wiring Diagram	SB CM02Wiring Diagram	SB DE02Wiring Diagram	SB DE04Wiring Diagram
 485接口或者232接口	 485接口	 数字量输入	 数字量输入
Terminal Definition	**Terminal Definition**	**Terminal Definition**	**Terminal Definition**
Ground: for connecting shielded wire	Ground: for connecting shielded wire	DIf: number Volume enter: . 0: No.1aisle; . 1: No.2aisle; M:24VPower common terminal, support Supports bidirectional input, can be positive or negative.	DIf: number Volume enter: M:24VPower common terminal, support Supports bidirectional input, can be positive or negative.; . 0: No.1aisle; . 1: No.2aisle; . 2: No.3aisle; . 3: No.4aisle
TX/B:RS232-Tx/RS485DefinitionA	A:485NormativeA		
RTS: Request to send (TTL)	M: Signal ground		
M: Signal ground, logic common	B:485NormativeB		
RX/A:RS232-Rx/RS485DefinitionB	●null	**Register Map:I7.0,I7.1**	**Register Map:I600.0,I600.1, I600.2,I600.3**
5V:+5VPower output, max.50mA	Note1: Direct configurationSB CM01use.	Note: Direct configuration SBDT04use.	Note1：Each channel has an indicator light
Note:485Wiring, Xizi and485Contrary to the standard definition, if the connection fails, it can be replacedA,BTry the line sequence.		Note2: Each channel has an indicator light	
Note: Direct configurationSB CM01use.			

SB DE06Wiring Diagram	SB QT02Wiring Diagram	SB QT04Wiring Diagram	SB QT06Wiring Diagram
 数字量输入	 数字量输出	 数字量输出	 数字量输出
Terminal Definition	**Terminal Definition**	**Terminal Definition**	**Terminal Definition**
DIf: number Character quantity lose enter: M:24VPower common terminal, support Supports bidirectional input, can be positive or negative.; . 0: No.1aisle; …; . 5: No.6aisle	QUR:transistor Output Channel: . 0: No.1aisle; 1: No.2aisle; L+: 24VPower positive; M: 24VNegative power supply	QUR:transistor Output Channel: L+:24VPower positive; . 0: No.1aisle; . 1: No.2aisle; . 2: No.3aisle; . 3: No.4aisle	QUR:crystal Body Pipe Outlet: . 0: No.1aisle; . 1: No.2aisle; . 2: No.3aisle; . 3: No.4aisle; . 4: No.5aisle; . 5: No.6aisle
Register Map:I600.0,I600.1, I600.2, I600.3,I600.4,I600.5 Note1: Each channel has an indicator light.	**Register Map:Q7.0,Q7.1** Note2: Each channel has an indicator light	**Register Map:Q600.0,Q600.1, Q600.2,Q600.3** Note1: Each channel has an indicator light.	**Register Map:Q600.0,Q600.1, Q600.2, Q600.3,Q600.4,Q600.5** Note1：Each channel has an indicator light

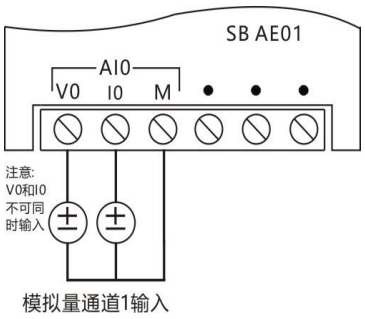
SB DT04Wiring Diagram



Terminal Definition	
QUR:transistor Output Channel	. 0: No.1aisle
	. 1: No.2aisle
DIf: Input channel	. 0: No.1aisle
	. 1: No.2aisle
L+	24VPower positive
M	24VNegative power supply

Note1: Direct configurationSB DT04Use. Note2: Each channel has an indicator light

SB AE01Wiring Diagram

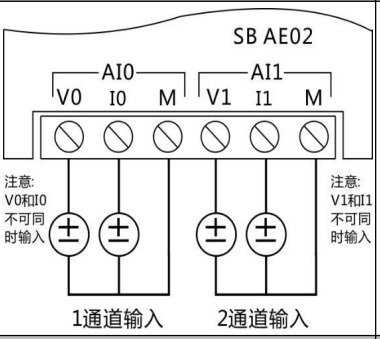


Terminal Definition	
AIsimulation Quantity Channel 1enter	V0: No.1Channel voltage input
	I0: No.1Channel current input
	M: No.1Channel common

Register Map:IW600

Note: Support voltage or current input, through the Line distinction,V0andI0Cannot be entered simultaneously.

SB AE02Wiring Diagram

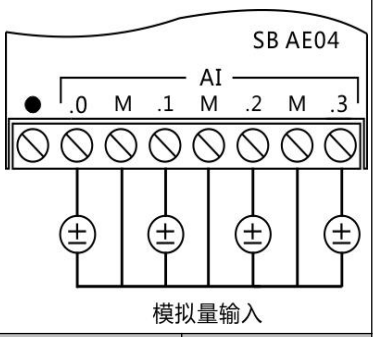


Terminal Definition	
AI0simulation Quantity Channel 1enter	V0: No.1Channel voltage input
	I0: No.1Channel current input
	M: No.1Channel common
AI1simulation Quantity Channel 2enter	V1: No.2Channel voltage input
	I1: No.2Channel current input
	M: No.2Channel common

Register Map:IW600,IW602

Note: Each channel supports voltage or current input. Differentiate by wiring,VandICannot be entered simultaneously.

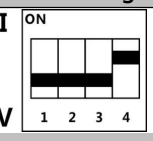
SB AE04Wiring Diagram



Terminal Definition	
●null	
. 0: No.1Input	
. 1: No.2Input	
. 2: No.3Input	
M：Public end	

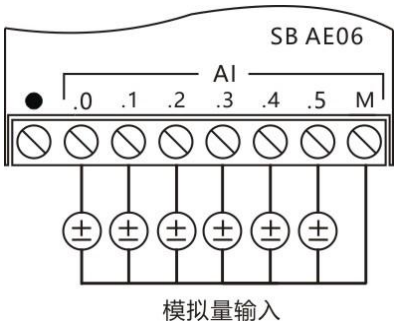
Register Map: IW600,IW602, IW604,IW606

Dial setting



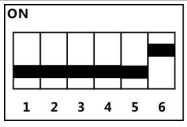
Note: Support voltage or Current input, through Dial selection on the back. Each dial pair Yingyi individual aisle, ON For current, OFF is voltage.

SB AE06Wiring Diagram



Terminal Definition	
●null	. 3: No.4Input
. 0: No.1Input	. 4: No.5Input
. 1: No.2Input	. 5: No.6Input
. 2: No.3Input	M：Public end

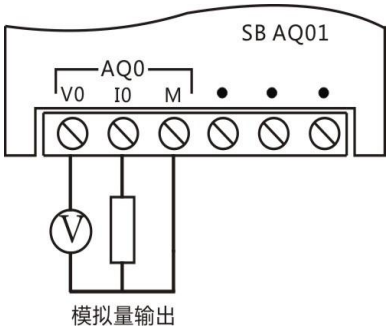
Dial setting



Note: Support voltage or current Input, through the back dial Switch selection. Each road dial Code corresponding terminal aisle, ON is the current, OFF is voltage.

Register Map:IW600,IW602,IW604,IW606, IW608,IW610

SB AQ01Wiring Diagram

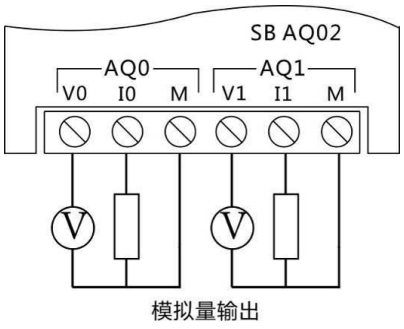


Terminal Definition	
AQ: Analog input Outlet1	V0:aisle1Analog voltage output
	I0:aisle1Analog current output
	M: Analog output common terminal

Register Map:QW600

Note: Analog output supports simultaneous output of voltage and current. Distinguished by wiring terminals.

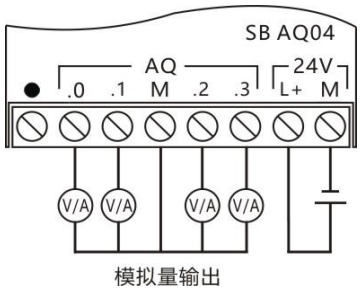
SB AQ02Wiring Diagram

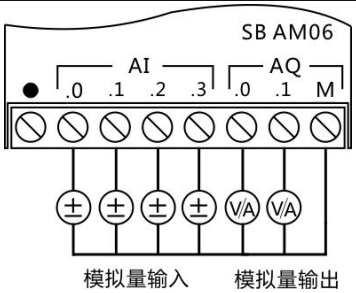


Terminal Definition	
AQ：Analog Output Channel1	V0:aisle1Analog voltage output
	I0:aisle1Analog current output
	M: Analog output common terminal
AQ1：Analog Output Channel2	V1:aisle2Analog voltage output
	I1:aisle2Analog current output
	M: Analog output common terminal

Register Map:QW600,QW602

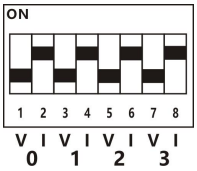
Note: Analog output supports simultaneous output of voltage and current. Distinguished by wiring terminals.

SB AQ04Wiring Diagram	Terminal Definition
 模拟量输出	null
	. 0: Analog output1aisle
	. 1: Analog output2aisle
	M: Analog output common terminal
	. 2: Analog output3aisle
	. 3: Analog output4aisle
	L+:powered by24VPower positive
Note:SB AQ04Need external24Vpowered by; **Register Map:QW600,QW602, QW604,QW606**	M:powered by24VNegative power supply

SB AM06Wiring Diagram	Terminal Definition	
 模拟量输入 模拟量输出	AIAnalog input	. 0: No.1road
		. 1: No.2road
		. 2: No.3road
		. 3: No.4road
	AAnalog output	. 0: No.1road
		. 1: No.2road
	null	M：Public end

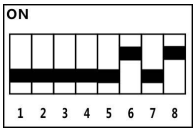
Register Map:IW600,IW602,IW604,IW606,QW600,QW602

SB AQ04Dial

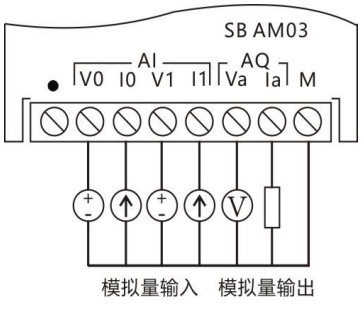


Dial code definition
1:ON,2:OFFaisle1Output voltage
1:OFF,2:ONaisle1Output Current
3:ON,4:OFFaisle2Output voltage
3:OFF,4:ONaisle2Output Current
5:OFF,6:ONaisle3Output Current
5:ON,6:OFFaisle3Output voltage
7:ON,8:OFFaisle4Output voltage
7:OFF,8:ONaisle4Output Current

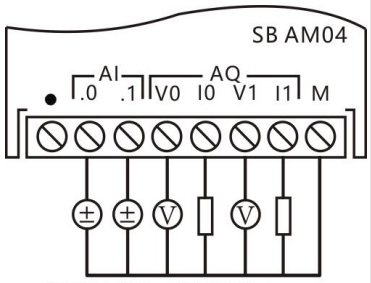
SB AM06Dial



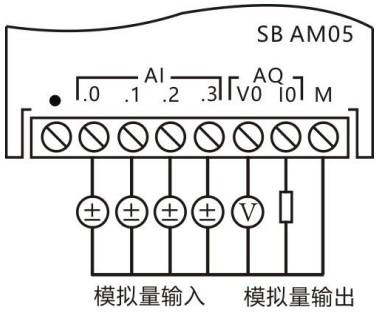
Dial code definition
1:aisle1Analog input,ON: current;OFF:Voltage
2:aisle2Analog input,ON: current;OFF:Voltage
3:aisle3Analog input,ON: current;OFF:Voltage
4:aisle4Analog input,ON: current;OFF:Voltage
5:ON,6:OFFOutput1Channel voltage
5:OFF,6:ONOutput1Channel current
7:ON,8:OFFOutput2Channel voltage
7:OFF,8:ONOutput2Channel current

SB AM03Wiring Diagram	Terminal Definition	
 模拟量输入 模拟量输出	null	M：Public end
	AImold Pseudo-quantity enter	V0: No.1Voltage input terminal
		I0: No.1Current input terminal
		V1: No.2Voltage input
		I1: No.2Current input terminal
	AQmold Pseudo-quantity Output	V: No.1Voltage output terminal
		Ia: No.1Current output terminal

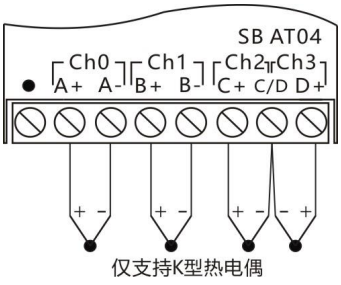
Register Map:IW600,IW602, QW600

SB AM04Wiring Diagram	Terminal Definition	
 模拟量输入 模拟量输出	null	M：Public end
	AIAnalog input enter	. 0: No.1road
		. 1: No.2road
	AQAnalog Output	V0: No.1Road voltage
		I0: No.1Road current
		V1: No.2Road voltage
		I1: No.2Road current

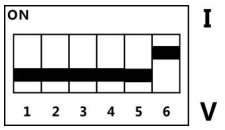
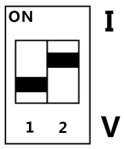
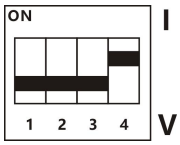
Register Map:IW600,IW602, QW600,QW602

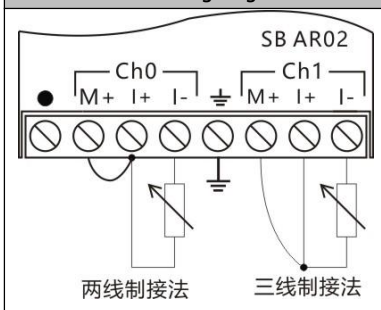
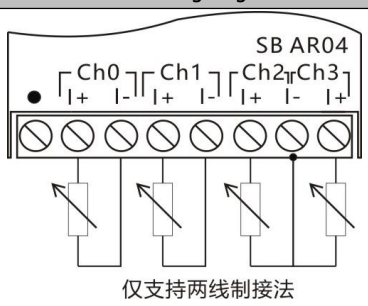
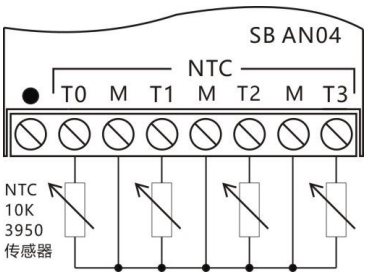
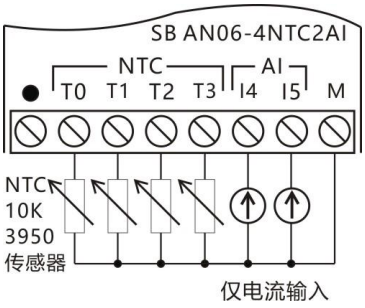
SB AM05Wiring Diagram	Terminal Definition	
 模拟量输入 模拟量输出	null	M：Public end
	AIAnalog enter	. 0: No.1road
		. 1: No.2road
		. 2: No.3road
		. 3: No.4road
	AQAnalog Output	V0: Voltage output terminal
		I0: Current output terminal

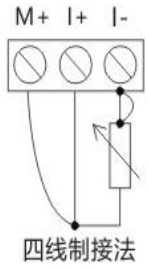
Register Map:IW600,IW602,IW604, IW606,QW600

SB AT04Wiring Diagram	Terminal Definition	
 仅支持K型热电偶	Ch0: No.1 Thermocouple	A+:positive electrode
		A-:negative electrode
	Ch1: No.2 Thermocouple	B+:positive electrode
		B-:negative electrode
	Ch2: No.3 Thermocouple	C+:positive electrode
		C/D:3,4road Public negative pole
	Ch3: No.4 Thermocouple	D+: No.4Road positive

Register Map:IW600,IW602, IW604,IW606

Dial setting	Dial setting	Dial setting	
			
Note: Analog input supports voltage or current. Differentiate by wiring terminals, and do not input at the same time Analog output supports voltage and current Output simultaneously, distinguished by wiring terminals.	Note: Analog input supports voltage or current , Select by dialing the dial on the back of the signal board. The dial corresponds to one channel.ONis the current, OFFThe analog output supports voltage. And current output at the same time, through the terminal area point.	Note: Analog input supports voltage or current. Select through the DIP switch on the back of the signal board. One dial corresponds to one channel.ONFor electricity flow,OFFThe analog output supports simultaneous output of voltage and current through the wiring terminal. distinguish.	

SB AR02Wiring Diagram	SB AR04Wiring Diagram	SB AN04Wiring Diagram	SB AN06Wiring Diagram
			

Terminal Definition		Terminal Definition		Terminal Definition	Terminal Definition	
●null	Ground: Shield	●null		●null	●null	
Ch0 No.1aisle	M+: Line resistance compensation	Ch0No.1aisle	I+:PT100end	T0: No.1road	NTC: temperature collection aisle	T0:1Road temperature collection
	I+:PT100end		I-:PT100end	T1: No.2road		T1:2Road temperature collection
	I-:PT100end	Ch1No.2aisle	I+:PT100end	T2: No.3road		T2:3Road temperature collection
Ch1 No.2aisle	M+: Line resistance compensation		I-:PT100end	T3: No.4road		T3:4Road temperature collection
	I+:PT100end	Ch2No.3aisle	I+:PT100end	M：Public end	AI:mold Pseudo input	I4: No.1Analog input
	I-:PT100end		I-:3,4aisle PT100Public terminal	**Register Map:IW600,IW602, IW604,IW606**		I5: No.2Analog input
Four-wire system Connection method 		Ch3No.4aisle	I+:PT100end		M: Common port for all channels	
Register Map:IW600,IW602		**Register Map:IW600,IW602, IW604,IW606**			**Register Map:IW600,IW602, IW604,IW606,IW608,IW610**	

Special Notes: There is a high-temperature film on the surface of the signal board DIP switch. You can pierce it with a sharp tool (such as tweezers) and gently turn it. The DIP switch may also be switched during debugging before leaving the factory. It is normal for the high-temperature film to be punctured or lost.

4.6Frequently asked questions

4.6.1 Does it support Smart V3 version of PLC? Does it support installing two signal boards at the same time?

A: The firmware version has been fully updated toV30, supports installing two at the same time. The version number is on the top of the front of the signal board housing, for example

GB-H4AJU703V31,at last3The bits represent the version number.

4.6.2 Why should some digital signal boards and analog signal boards be configured as SB CM01?

Answer: Resource mapping is achieved through this special configuration.

4.6.5 When the non-conventional signal board is configured as SB CM01, if it is installed in slot SB0, must the address be 2? If it is installed in slot SB1, must the address be 3?

A: It is not necessary.SB0Slot number, address can also be selected3, then the signal board mapping address isI616andQ616 To begin with, in short, the addresses of the two slots can only be set2or3, where does the mapping address start? The key is the address number, not the slot number.

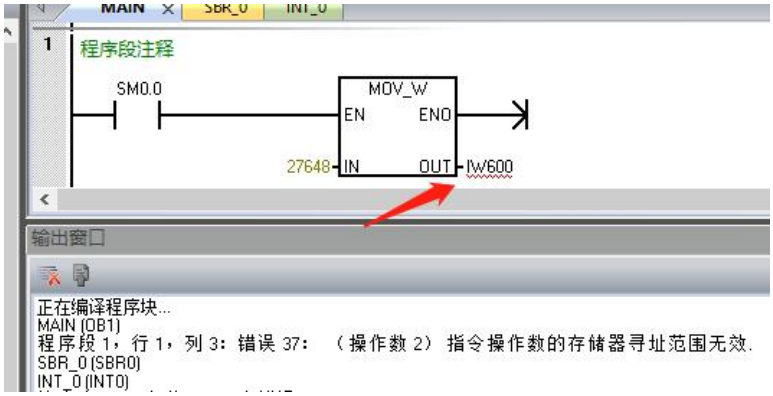
4.6.6 After the signal board is plugged in, the LINK indicator light does not light up.

answer:LINKThe indicator light is used to indicate that the communication is normal. It will only be displayed when the configuration is set correctly and the system block is downloaded toPLCIf it is off, it means setting error or device failure.

4.6.7 The configuration is correct and the system block has been downloaded, but the LINK indicator is still off. A: Check whether the program willPORT1orPORT2InitializeModbusIf so, delete this part of the program.

4.6.8 Can the analog channel directly read the AIW and AQW registers? A: No, remap toIW,QWarea, you can directly read and write. For query, please refer to4Section content.

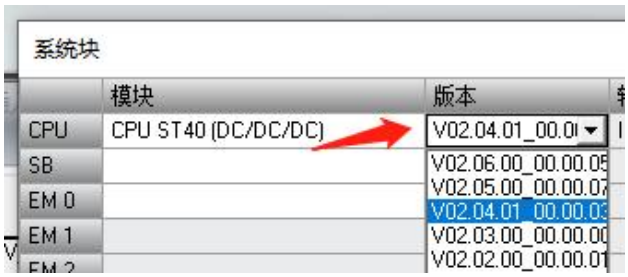
4.6.9 Programming Interface If the IW600 or QW600 register is underlined in red, the compilation fails as shown below.



There are three possibilities. Possibility 1:S7The software version is low, it must be2.04or above. Check as follows:

The picture shows2.05version that meets the requirements.

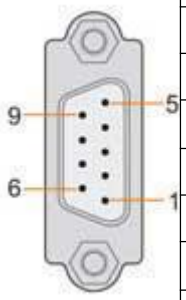
Possibility 2: Configuration interfacePLCThe host version selected is too low, it must be2.04or above. Check as follows:



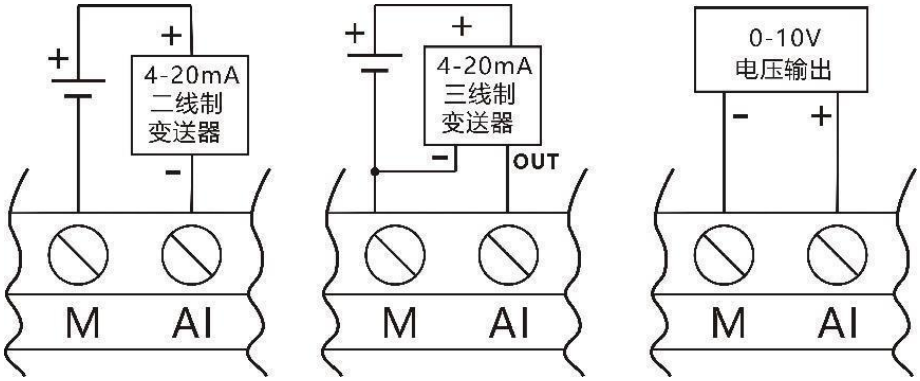
Possibility three:PLCThe firmware version is too low, it must also be2.04Version or above, check the method as follows, the figure below shows the firmware version numberV2.03, so it needs to be upgradedPLCFirmware, upgrade method consultationPLCHost manufacturer.

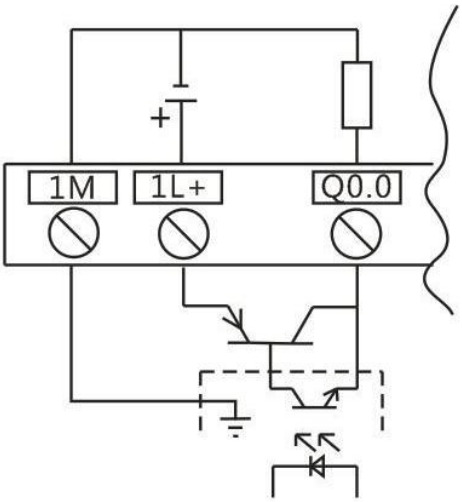
5.485Communication interface definition

Gongbei compact/standard Smart host comes with a 485 interface, supporting PPI communication, Modbus 485 communication, and free port communication. The pin definition of this interface is as follows:

Connectors	Pin No.	PORT0	Note: The A and B signals defined in the table are According to the definition of 485 standard, if you look at the Western The sub-manual is just the opposite, this is because Xizi definition and standard 485 definition On the contrary, but the internal circuit design and Xizi Considering that most customers The port is connected to a non-Xizi 485 device, so According to the standard 485 interface marking, if using Connect the Xizi 485 device to the user and adjust the line sequence Just change it.
	1	Chassis grounding	
	2	+ 24V Ground	
	3	RS485 Signal A	
	4	Send application RTS	
	5	+5V Ground	
	6	+5V	
	7	+24V	
	8	RS485 Signal B	
	9	NC	
	Connector housing	Chassis grounding	

6.Analog input wiring diagram



Note: In the figure above, AI indicates the analog input channel of the host, expansion module or signal board. Whether it is a voltage input channel or a current input channel varies from product to product. Some products require configuration selection in the system block, some are switched by DIP switches, and some are distinguished by wiring terminals. For details, please refer to the corresponding chapters.

7.Internal schematic diagram of transistor output